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ABSTRACT

The first of four volumes in Research Report No. 7 of the Health Services Mobility Study (HSMS), this book contains 143 task descriptions covering most of the medical activities carried out by diagnostic radiologists. (The work carried out by radiologic technologists, and administrative, machine-related, and nursing-type functions are found in Volumes 2 and 3. Volume 4 is an index of all the tasks in the three volumes.) The first three volumes present the tasks in a given area in numerical order by code number. These task descriptions are offered for use as instructional materials, as inputs to the design of career ladders, for the structuring of jobs and assignment of work to job titles, and as inputs to the development of performance evaluation instruments and proficiency tests. Chapter I of this volume defines "task" and tells how the descriptions were developed. The task descriptions are presented in Chapter 3 by Code Number, the steps of the task described in logical sequence in considerable detail. Chapter 2 is a guide to the tasks, arranged in logical grouping for easy reference: (1) By system of the body, (2) by function (e.g., consultations, procedures, teaching), and (3) by main type of recipient (e.g., patient, pediatric patient, student, etc.). (HD)

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TASK DESCRIPTIONS IN DIAGNOSTIC RADIOLOGY

Research Report No. 7

Volume 1

MEDICAL TASKS: WHAT THE RADIOLOGIST DOES

by
Eleanor Gilpatrick, Director
Health Services Mobility Study

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Many individuals cooperated to make it possible to produce the task descriptions presented here. We would like to thank Mr. Mo Katz, Deputy Director of the Montefiore Hospital and Medical Center in New York City for welcoming us to the hospital and ensuring that all went well. The administrative staff were extremely cooperative.

We are grateful to the distinguished professionals who gave unstintingly of their time as critical reviewers of our MD-level task descriptions. Dr. Earl E. Brant, Director of Radiology at Lenox Hill Hospital in New York City, and Dr. Gale R. Ramsby, Assistant Chief of Radiology at Veterans' Administration Hospital in West Haven, Connecticut, were our chief reviewers. Our main in-house reviewers were Dr. Saul Rakoff and Dr. Stanley S. Siegelman (who is now at Johns Hopkins), of Montefiore's Department of Radiology. Additional reviews were done by Dr. James S. Moore, Jr., at Veterans' Administration Hospital in Minneapolis, Minnesota, Dr. Harvey Prince, Medical Director of Pfizer Medical Systems, and Drs. Norman Leeds and Ruth Rosenblatt at Montefiore.

We deeply appreciate the time given us by busy professionals whose work we attempted to describe. The "performers" we interviewed and observed at Montefiore include Drs. Thomas Beneventano, Marvin Kauff, Henry Pritzker, Saul Rakoff, Ruth Rosenblatt, Irwin Schlossberg, Stephen Schoenbaum, Stanley Siegelman, and Seymour Sprayregan. Additional tasks were collected at Mt. Sinai Hospital and Medical Center in New York City, where Dr. Elliott Greenberg was very helpful.

We thank these professionals for their help. Any mistakes remaining or controversial issues still unresolved in the task descriptions are solely the responsibility of the Health Services Mobility Study.

The bulk of the field work for these task descriptions was carried out by HSMS senior job analysts Jeanne Bertelle and Irene Seifer. The very demanding job of typing the tasks was supervised and largely carried out by Julia M. Caldwell.

A special note of thanks goes to our Project Officer, Mr. William Throckmorton, for his continued understanding and encouragement.

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PREFACE

The Health Services Mobility Study (HSMS) has been involved in research in the health manpower field in the United States since 1967. It has designed methods to analyze jobs, create job ladders, develop curriculum objectives, and evaluate performance. HSMS is sponsored by the City University of New York (CUNY) through the Research Foundation and the Hunter College School of Health Sciences. Since 1967, funding for HSMS has come from the Office of Economic Opportunity, the Health Services and Mental Health Administration and the Bureau of Health Manpower, both of HEW, and, primarily, the U. S. Department of Labor, Manpower Administration, now the Employment and Training Administration. The Director of the Project, Eleanor Gilpatrick, holds the rank of Associate Professor at the Hunter College School of Health Sciences, City University of New York.

This report presents the core data of the first application of the HSMS task analysis method to an entire functional area, i.e., Diagnostic Radiology. This work is reported in two Research Reports as follows:

Research Rpt. No. 7	TASK DESCRIPTIONS IN DIAGNOSTIC RADIOLOGY
Vol. 1	Medical Tasks: What the Radiologist Does.
Vol. 2	Radiologic Technologist Tasks Dealing With Patient Procedures.
Vol. 3	Machine-Related, Patient Care and Administrative Tasks: What Radiologists, Technologists, Nurses, and Physicists Do To Run Things and Look After Patients and Equipment.
Vol. 4	Index of Tasks by Code Number and Extended Name.

These four volumes are the "core" documents, i.e., they present approved "normative" task descriptions in radiology. The first three volumes present the tasks in a given area in numerical order by code number. Each document describes how the tasks were developed and how to read them. Each includes listings that arrange the tasks by specialty or function. Volume 4 summarizes the tasks presented in the first three volumes. It lists the extended names of all the tasks in numerical order by task code number, citing the volume in which the task description is to be found.

Research Rpt. No. 8	USING TASK DATA IN DIAGNOSTIC RADIOLOGY
Vol. 1	Job Ladders in Diagnostic Radiology: Assigning Tasks to Jobs.
Vol. 2	Safe Practice and Radiation Health Protection Aspects of Tasks.
Vol. 3	Curriculum Objectives For Radiologic Technology.

These volumes make use of and refer to the tasks presented in Research Report No. 7. Therefore, only the abbreviated names of tasks and their code numbers are used when the tasks are discussed.

Volume 1 shows the assignment of tasks to levels, indicates how tasks relate to one another, and makes recommendations on a job ladder and job structuring. It summarizes and includes the skill and knowledge data related to the tasks in Research Report No. 7. It tells the hospital administrator how to use the data for assigning tasks to titles and jobs.

Volume 2 highlights the safe practice features of the task descriptions.

Volume 3 presents the curriculum objectives for use in an educational program at the radiologic technologist level. Research Report No. 7 serves as instructional materials in connection with this volume.

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FOREWORD

The Bureau of Radiological Health of the Food and Drug Administration is responsible for minimizing unnecessary exposure of the population to radiation, including that used in medicine. The Bureau's programs include activities to improve the education of health care personnel in the safe use of radiation. This is important because adequate education of professional and ancillary personnel who prescribe, conduct or interpret radiologic examinations is a crucial determinant in assuring optimum medical care with minimum radiation exposure.

The educational process in the medical radiation area, as in any field, can be most effective when it is based upon the actual tasks and responsibilities which individuals will be called upon to undertake in practice. Systematically and comprehensively identifying and describing those tasks is thus an important prerequisite in designing effective curricula and credentialing tools. The type of research which is represented by the series of projects entitled "Task Descriptions in Diagnostic Radiology," conducted by the Health Services Mobility Study, can be an important step in this direction. These particular projects, culminating in several individual reports, contain task descriptions and curriculum objectives of remarkable depth and scope, including much material on protecting patients against unnecessary radiation exposure.

Although the Bureau of Radiological Health has not contributed to the design of these projects or to the content of the reports, we hope that they can serve as a useful resource for those responsible for designing basic and continuing educational programs for medical radiation users, and thus that they can contribute to the safe and effective use of radiation in medical diagnosis.

Mark Barnett
Associate Director
Division of Training & Medical Applications
Bureau of Radiological Health
Food and Drug Administration

CHAPTER 1

ABOUT THE TASK DESCRIPTIONS

INTRODUCTION

Research Report No. 7 is a product of the first full-scale demonstration of the task description method of the Health Services Mobility Study (HSMS). All the work found in a department of Diagnostic Radiology is presented as task descriptions in the three volumes of the Report.

This volume contains 143 task descriptions. They cover most of the medical activities carried out by diagnostic radiologists. These descriptions were prepared over the period August, 1972, through January, 1976.

The work carried out by radiologic technologists,and the tasks of administration, film processing, machine maintenance, nursing, and housekeeping are found in Volumes 2 and 3. Volume 4 is an index of all the tasks in the three volumes.

These task descriptions are offered for use as instructional materials, as inputs to the design of career ladders, for the structuring of jobs and assignment of work to job titles, and as inputs to the development of performance evaluation instruments and proficiency tests. In Research Report No. 8, HSMS uses technologist-level tasks to design curriculum objectives. In addition, because the descriptions present desirable work behaviors, we believe that the task descriptions can be used to improve the quality of work, especially with regard to radiation protection and patient safety, and can be used for human resources development, planning, and counseling. The materials are adaptable for consumer education as well.

In order for the reader to use this material, he needs to know how it was collected and developed, what the tasks cover, how HSMS defines "task," and how to read the task descriptions. This chapter presents such information.

The task descriptions are presented in numerical order by code number in Chapter 3. Chapter 2 is a guide to the tasks. It arranges the abbreviated names of the tasks in several logical groupings with the code numbers given so the reader can get to the tasks that interest him or her. The groupings in Chapter 2 list the tasks by system of the body, by function (such as consultations, procedures, teaching), and by main type of recipient (such as any patient, pediatric patient, student, etc.).

ABOUT THE TASKS: COLLECTION AND COVERAGE

The HSMS task definition is presented later in this chapter. This section describes how the task descriptions were developed and indicates the coverage in this volume.

Orientation

If one conceives of all the kinds of work that get done in a department in order for it to carry out the function of diagnostic radiology, one might think of a great field or pool of work. Each kind of work is carried out in discrete units. Theoretically, it does not matter how the units are allocated to jobs, as long as all the work is done. In practice, although common sense is usually enough to discern that some units require someone trained as a radiologist, there are large areas where it is unclear who should do what.

The HSMS method avoids this issue until it is clear what the work units are. Only at a later stage do we determine the skill and knowledge requirements for work units and their relative levels. The HSMS method begins with descriptions of all the work units, regardless of the job titles in which they are found.[1] We call the work units "tasks."

This volume is one of three that together present most of the work that is done in a department of Diagnostic Radiology. Since we needed to divide the task descriptions into manageable volumes, we arbitrarily determined that this volume would contain task descriptions in diagnostic radiology that clearly reflect a medical content. These are the radiologist's medical tasks. Work that may be carried out by radiologists but that are of an administrative, machine-related or nursing-type function appear in Volume 3.

Collection of Data

Chapter 3 contains task descriptions. This means that tasks are identified by name, based (in this case) on the HSMS definition of task, and then the steps of the task are described in a logical sequence and include a good deal of detail.[2]

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[1] This assignment of work units to jobs varies according to the size of an institution, local practices and laws, relative scarcities of types of manpower, and the extent to which an institution is rationally organized.

The work in task identification and description is done in a multi-stage process. HSMS job analysts work in teams. They first determine how many people and what titles they must cover to have access to every kind of work done in the department. With Radiology, we soon learned that there were general procedures and specialities carried out by radiologists. With each "performer" interviewed the analysts first obtain an idea of all the work covered. The analysts then apply the HSMS definition of task (discussed later in this chapter) to break the work down into specific task units, making sure that nothing is left out. This is the task identification stage. From this point the performers are interviewed and sometimes observed, and the analysts write descriptions of how the tasks are done, including contingencies, alternative approaches and emergencies.

While this is going on, the HSMS Director and the analysts are also reviewing current professional literature in the area, in this case medical texts and journals in Radiology. These were culled for descriptions of clinical procedures. Other literature, covering issues such as patient safety, performance standards, and ethics was also reviewed. In addition, there were informal talks with professionals, educators,and people in government agencies. As a result, an overview emerged concerning certain procedures and activities which should be represented in the task descriptions, even if not always represented in current practice. We call these "desiderata."

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[2] This differentiates the HSMS method from most other task analysis methods which simply identify tasks, usually with a vague definition, and include a very brief name. The HSMS method includes a specific definition of task. Once identified, a task has a code number, an abbreviated name, a summary statement of the task,and a full task description.

The literature often provided information on alternative methods for carrying out tasks, contingencies to be taken account of, varieties of equipment available, and some indication of which options are more desirable.

The task descriptions written by the HSMS analysts go to the HSMS Director for review and editing. At this stage the tasks are rewritten to incorporate the literature of the field and the desiderata. The task identifications are critically reviewed for conformity to the HSMS definition, and, when necessary, the analysts are sent back to the field to obtain additional information.

The next phase involves critical review by professionals other than the performers who were interviewed by the HSMS analysts.[3] Each of the tasks presented in Chapter 3 has had a minimum of three reviewers. One reviewer is usually someone, other than the performer whose work is being described, who is at the institution where the material is being collected. Two other reviewers are then obtained who are experts and in leading positions in institutions other than the one where the data were obtained. Sometimes all three reviewers come from outside the institution;

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[3] See the acknowledgements page at the beginning of this volume.

for several tasks as many as five reviewers were obtained. The reviewers are asked to evaluate the tasks for correctness of language and sequence of procedures, to note omission of any tasks in the speciality area, and to indicate acceptable alternative methods. Reviewers are asked to concentrate on how the tasks should be done and to reflect national practice.

After the tasks are reviewed, the suggested changes are incorporated, additional tasks are collected and described when necessary, and any new or totally revised tasks are resubmitted for review as described here. When a task has been reviewed and revised as required by at least three reviewers, it is referred to as a "normative task," or an "N task," and is so marked.

Coverage

The reader will note that the collection of task descriptions is not like a sample survey. A sample survey would not cover all the work, but would cover only selected work. A sample would pick up the same work at many locations. We pick up and represent each unit of work only once. The reason is that our objective is to describe all approved work procedures for the purposes of developing instructional materials, curriculum objectives, and career ladders. For such purposes we want not just the most typical tasks; we want to cover the accepted but rare or difficult procedures, the emergencies, the contingencies, and the best possible practice. We are normative in approach, as well as descriptive. We are not dealing with probability theory, which requires sampling of the "universe" being studied. We attempt to present the universe.

Most of the tasks in Diagnostic Radiology were collected at Montefiore Hospital and Medical Center in New York City over the period August, 1972, to late 1975. The tasks were reviewed from 1973 until January, 1976. At Montefiore, which is a respected major voluntary hospital, we picked up the work in most radiology specialities, and some work done by residents not accounted for by other members of the department. Radiology tasks related to obstetrics and gynecology were collected at Mt. Sinai Hospital and Medical Center in New York City, another highly regarded voluntary hospital.

We include descriptions of some very new procedures involving computerized transverse axial tomography. To make our task descriptions more broadly based than the water-box brain scanner used at Montefiore, we obtained the literature on this new technology and were given access to the manuals of two different producers of the equipment. Our reviewers were asked to evaluate the tasks for their generic usefulness.

In a few instances, tasks that are performed rarely and were not carried out at the hospitals where we were collecting data were described solely from the literature, using the other tasks as models. In such cases we referred to the most recent articles; the task descriptions were subjected to review by at least four reviewers.

Every effort was made to include every procedure carried out [illegible] radiologists operating in hospital centers. However, some procedures at specialized centers, such as children's hospitals, may be missing. Our coverage implies that the work at any smaller scale establishments, such as private offices and ambulatory care facilities, is covered. We omitted tasks that are clearly obsolete or too dangerous to perform based on the advice of our performers and reviewers.

We have consciously chosen to omit the rare pneumomediastinography and epidural venography, and have chosen to omit coronary arteriography by way of the Sones and Amplatz techniques. The latter are usually done by cardiologists. However, we do include pneumography in connection with radiology of the female reproductive system and percutaneous coronary arteriography. In pelvimetry we cover only the Colcher-Sussman method.

Two of the tasks included appear to be controversial. Discography is not unanimously seen to be of value, and spinal cord angiography seems to be considered very dangerous. These two tasks were developed from the literature and critical review.

This volume includes several tasks which are not strictly medical, since they deal with the teaching of residents and research activities. However, since they reflect and require the educational levels of medical tasks, we include them in this volume.

Another order of tasks done by radiologists are medical, but seem to belong with our nursing-type functions in Volume 3. Such tasks include the removal of sutures, provision of emergency care, testing for sensitivity to contrast media, preparation of specimens, and urethral catheterization. These and tasks such as use of the film badge to monitor personal exposure to radiation were excluded from this volume and are included in Volume 3, based on an essentially arbitrary decision.

The reader may note in reading the tasks that some examination (procedure) tasks include specific steps (elements) involving sensitivity testing and emergency care. These are elements within tasks when the radiologist commonly administers the test and/or is commonly prepared to care for an adverse reaction as a part of the procedure. Based on our definition of task, there are separate tasks when the steps can be done by someone not doing the task in question. In this case, when tests are given beforehand, or when an MD is summoned to provide the care, the tasks are separate, while, if the one doing the procedure is the one to administer the test or provide the care, these are not separate tasks. We thus have it both ways.

DESIDERATA

The professional reading these tasks will find that many descriptions present more than one way to do the task, or include elements not necessarily done by the reader. In the case of multiple methods, these are offered to cover the varieties of approaches, such as percutaneous needle or catheter technique. We hope that the reader will find his or her way represented. In other cases, the options are trivial, and reflect institutional practices, such as whether a report is dictated or written, whether the nurse prepares the syringe or it is done by the performer.

In still other cases, we have consciously opted to include elements, steps, and whole tasks which represent desiderata; that is, steps or tasks that are beneficial to the patient, others on staff, or the performer. Some of these are briefly referred to below.

We include consultation tasks for most specialities, so that unwarranted or questionable requests for procedures may be reviewed, alternatives suggested, and the patient spared unnecessary radiation exposure. If such "deciding and/or approving requests for procedure" tasks are done at the clinical level, they would require the same activities as those included here. So, regardless of where this process takes place, in the department or prior to referral, we feel that these are important tasks.

We include a check that rules out known or possible pregnancy for female patients of reproductive age, and a check of proper shielding of the patient and anyone to remain in the room during the exposure to radiation. We have the performer using shielding personally. We have the performer consider the patient's radiation exposure history when deciding on additional exposure.

Wherever there is a puncture procedure, we have the performer applying pressure to the puncture site. We also have the performer pay attention to sterile technique and isolation or decontamination needs.

Wherever an invasive technique is involved we have the performer check for or obtain an informed consent. This is not everywhere required by law, but we subscribe to the American Hospital Association's Bill of Rights for Patients. One of these reads:

> The patient has the right to receive from
> his physician information necessary to give

> informed consent prior to the start of any procedure and/or treatment.[4]

Many steps involve the performer explaining to the patient what is happening and what will happen,and reassuring the patient. We agree that, "the patient has the right to considerate and respectful care."[5]

USES OF THE TASK DESCRIPTIONS

This document is not intended to describe fully how to use these task descriptions. However, we offer a list of possible uses that will be dealt with in subsequent reports:

1. The task descriptions can be used as instructional materials at two levels:
   a. At the clinical training level for medical students, interns, or residents, the tasks provide a check list, ordered in a logical sequence, of what goes on in the task. The tasks suggest what contingencies, options and emergencies are associated with the procedure.
   b. At the level of radiologic technologist or nurse specialist, the tasks can provide coherent descriptions of what the doctor is or may be doing; they are useful in particular for team training.
2. The task descriptions can provide an introduction to, or a basis for evaluation of, safe practice; they can be used to check on whether desired objectives are being accomplished.
3. The task descriptions, when combined with the HSMS skill and knowledge data, can become inputs in the development of performance-based curriculum objectives and educational ladders.

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[4] *The New York Times*, January 9, 1973.

[5] *Ibid*.

4. The task descriptions can be used as the basis for evaluation of work performance or as inputs to the development of job relevant proficiency tests (particularly for the selection of test content once the skill and knowledge data are collected).

5. The task descriptions can be used as objective references for the development of job descriptions, especially when edited to reflect the practices at a given institution.

6. The task descriptions can also be used in occupational counseling and for purposes of consumer education and protection.

THE HSMS DEFINITION OF TASK

In the HSMS view, each work activity needed to produce products, such as radiologic medical services, requires manpower which combines existing technology, knowledge, materials, and equipment with skills. The HSMS work unit is the "task." The HSMS definition of task is designed to result in the identification of a unit of work which can be moved from one job to another without disrupting other activities. The task is thus a unit of work which is smaller than a job as a whole, but large enough to have an identifiable, usable output.

The steps of the task, or elements, unlike the task, do not have an identifiable, usable output which can be independently consumed or used, or which can serve as an input in a further stage of production by an individual other than the performer. The HSMS task definition is as follows:

> A task is a series or set of work activities (elements) that are needed to produce an identifiable output that can be independently consumed or used, or that can be used as an input in a further stage of production by an individual who may or may not be the performer of the task.

In order to facilitate use of the definition, HSMS analysts use the following rules:

1. In principle, someone other than the performer of the task must be able to use or consume the output of the task.

2. Theoretically, it should be possible for there to be an elapse of time between tasks.

3. A task includes all the possible conditions or circumstances which a single performer is expected to deal with in connection with the production stage or the output involved.

4. A task includes all the elements that require continuous judgment or assessment by the same performer in order to assure the quality of the output.

5. A task includes all of the elements needed to produce an output which can be independently used or acted upon without special explanations to the next performer in the next stage of production.

6. A task includes all the elements needed to complete an output to a point at which another performer (who would continue with the next production sequence) would not have to redo any elements in order to continue.

7. A task includes all the elements needed to complete an output to a point at which another performer, in order to continue with the next stage of production, need not perform extra steps.

8. The task must not require that, for another performer to continue with the next stage in a production sequence, current institutional arrangements would have to be changed.

9. A task must be sufficiently broad in statement that it can be rated on its frequency of occurrence.

An example of how the rules work is as follows: An air contrast study of the stomach often is done when a barium upper gastrointestinal study is done. Is there one task or two? We say two, because the air contrast can be ordered to be done independently; it can follow the barium study with an elapse of time, and can be carried out by a different performer. The same performer may do both tasks in sequence, but then two tasks have been performed by the same person.

READING THE TASKS

The task descriptions in Chapter 3 follow the format presented in Figure 1, the HSMS Task Description Sheet. At the top right is the task's Code Number. A code number is assigned to the task which uniquely stands for the contents of the task, covering the task's output, what is used, the kind of recipient or respondent dealt with, and how the task is done. Regardless of the job title, institution, or industry in which the task is found, it will always have the same code number. The number itself has no intrinsic meaning.

The basic aspects of the task appear in items 1 through 4 on the left of page 1 of the Task Description Sheet. These help the analysts in the task identification stage and help differentiate one task from another. The term "output" is used to mean the result of an independent stage in a larger process of production in an institution, assuming the current organization of work activities. "What is used" in a task includes all the things which the performer is expected to be able to use or choose from to produce the identified output.

The "recipient, respondent or co-worker" involved in a task reflects the special characteristics or condition of the people with which the performer must be trained to deal. For example, certain procedures

Figure 1. HSMS

TASK DESCRIPTION SHEET

Task Code No. ____

This is page 1 of ___ for this task.

1. What is the output of this task? (Be sure this is broad enough to be repeatable.)

2. What is used in performing this task? (Note if only certain items must be used. If there is choice, include everything or the kinds of things chosen among.)

3. Is there a recipient, respondent or co-worker involved in the task? Yes...( ) No...( )

4. If "Yes" to q. 3: Name the kind of recipient, respondent or co-worker involved, with descriptions to indicate the relevant condition; include the kind with whom the performer is not allowed to deal if relevant to knowledge requirements or legal restrictions.

5. Name the task so that the answers to questions 1-4 are reflected. Underline essential words.

List Elements Fully

6. Check here if this is a master sheet..( )

are carried out in the same way for all patients. These are "any patient" tasks. In other cases, a procedure is different according to the age level of the patient. We can have a "pediatric task" and a different, "non-pediatric" task related to the same type of examination, and there are thus two tasks. In some cases the task is only applied to a given type of patient such as "gravid female."

We assume that "pediatric" varies in its age cut-off reference as is appropriate to a given procedure. We use "non-infant" in cases where the cut-off between tasks groups children older than infants with the rest of the patient population. An example is catheter vena cavography, which is a non-infant task as we have described it.

The "name of the task" (item 5 on the Task Description Sheet), summarizes the task in a paragraph-length statement. The underlined portion of the statement is referred to as the "abbreviated task name." The latter is most useful for listings, while the extended name avoids ambiguity when tasks are listed for reference to their contents.

Under the Task Code Number the reader is told the number of pages that the task runs in the statement, "This is page ___ of ___ for this task." All the tasks bear the notation "OK-RP;RR;RR" and are checked as master sheets on the lower right of the first page. This indicates that the task has had the required minimum of three reviewers and is a "normative" task.[6]

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[6] RP stands for resource person, i.e., the in-house reviewer; RR stands for resource respondent, i.e., outside reviewer. In actual practice, these merely show three reviewers; additional reviewers are not recorded on the sheet.

The description of how the task is done begins with the column on the right on the first Task Description Sheet and continues for as many pages as necessary on "continuation sheets."

As the work progressed, we developed certain language conventions of which the reader should be aware for ease of comprehension. These are briefly described as follows:

1. The person doing the task is always referred to as the "performer" regardless of his or her usual job title or rank. This provides a standard format and leaves for a later stage any battles over who should do what.[7]
2. The task always begins with an initiating element that indicates how it comes about that the performer is doing the task.
3. The same or similar activities tend to be described with similar language wherever these appear to assist analysts in spotting elements that overlap from task to task. This facilitates curriculum development even if it makes for dull reading.
4. Each task is written so that it is complete within itself. Therefore, there is repetition from task to task.
5. Certain phrases should be interpreted by the reader to indicate that another task has been generated by virtue of this task. Phrases such as "performer arranges...," "performer has...[done]" are examples.
6. When a task may either be done by the performer or delegated, a separate task is generated. The signal for such tasks are phrases such as "...or decides to do personally," or "performer plans to...."

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[7] We have come across individuals who bristle at being referred to as "performer" rather than a formal title. No disrespect is meant, and we ask the reader to indulge us in this.

7. When a particular part of a task represents an element that may or may not be done depending on institutional practice, personal preference, the state of the art, or the patient's condition, we use the phrase "performer may" or "may" before the description. Where the performer must make a choice as part of the task we have tried to make that explicit: "performer decides," "performer considers whether."

8. The specific content of some steps in a task, such as sizes or types of materials, contrast media, tests made, or data evaluated may vary as the state of knowledge in the field changes or new technology develops. There may be variations which reflect the condition of the patient, institutional facilities, or what was already done. There may also be variations of choices or steps reflecting current controversy or personal preference. We do not attempt to resolve these problems; we simply acknowledge them. Thus, the reader will find the phrase "as appropriate" in many steps. The phrase is used to cover these contingencies. We leave it to the instructor to select what is "true" or "correct" at any point in time.

A good many of the task descriptions state explicitly what are actually lightning-fast thought processes on the part of the performer when he or she considers what to do, interprets, draws conclusions, or makes selections. Some of the performers we interviewed and some of the practitioners we met found our explicit statements annoyingly drawn out and self conscious. We use this style because we eventually rate the tasks for the skills (some of them intellectual or decision-making skills) required to carry out each task. This explictness of language is useful for our curriculum development and may prove useful for instructional purposes.

By way of contrast, much of the knowledge applied or used in the tasks is not specified. We refer to the use of knowledge by such words as "considers," "evaluates," "determines," "selects," and/or "appropriate." The reason is that the HSMS method incorporates a knowledge classification system, and the tasks are eventually rated for the knowledge categories required to carry out each task.

Note

The reader should be aware that, though the tasks in Chapter 3 are presented in numerical order by code number, not every number is represented. The first code number is Code 1; the last is Code 489. There are only 143 tasks in Chapter 3. The reason is that the code numbers are assigned in sequence as the tasks are processed, and the other tasks appear in other volumes or reports.

CHAPTER 2

LISTING OF ABBREVIATED TASK NAMES BY CATEGORY AND CODE NUMBER

TASKS LISTED BY SYSTEM OF THE BODY

Category and Abbreviated Task Name	Task Code No.
CIRCULATORY SYSTEM	
Blood	
Deciding on type of non-neurologic angiography procedure to order for any patient in consultation with referring physician, surgeon, and/or other specialist.	469
Conducting peripheral arteriography of any patient by percutaneous selective catheterization or direct needle puncture.	470
Conducting ascending or descending venography of lower extremities of any patient by direct needle puncture.	471
Conducting catheter thoracic aortography of any patient.	472
Conducting catheter abdominal aortography and/or selective visceral arteriography of any patient.	473
Conducting percutaneous translumbar abdominal aortography of any patient.	474
Conducting percutaneous splenoportography of any patient.	475
Conducting selective pelvic arteriography of non-pediatric gravid or nongravid female patient.	476
Conducting catheter pulmonary angiography of any patient.	477
Conducting selective bronchial arteriography of any patient.	478

TASKS LISTED BY SYSTEM OF THE BODY (continued)

Category and Abbreviated Task Name	Task Code No.
CIRCULATORY SYSTEM	
Blood (continued)	
Conducting selective thyroid angiography of any patient.	479
Conducting selective subclavian arteriography of any non-pediatric patient to evaluate thoracic outlet syndrome.	480
Conducting intravenous angiocardiography of any patient by percutaneous selective catheterization or direct needle puncture.	481
Conducting catheter vena cavography and/or selective renal or adrenal venography of any non-infant patient.	482
Conducting percutaneous coronary arteriography and/or left ventriculography of any patient.	483
Reading, interpreting and making recommendations on non-neurologic angiographic and related studies and/or giving opinions to clinicians or co-workers; explaining opinions or dictating findings and recommendations.	484
Participating in meetings of angiographers, vascular surgeons and cardiologists to discuss new developments, cases of interest, and case problems in the field of angiography, vascular and cardiovascular surgery.	485
Providing clinical training for radiology residents in non-neurologic angiography.	486
Planning and presenting lectures or case conferences on non-neurologic angiography for radiology residents.	487
Lymph	
Deciding whether to order lymphangiography of any patient or alternative studies and recommending technique, in consultation with referring physician.	328

TASKS LISTED BY SYSTEM OF THE BODY (continued)

Category and Abbreviated Task Name	Task Code No.
CIRCULATORY SYSTEM	
Lymph (continued)	
Conducting lymphangiography of any patient.	329
Reading, interpreting and making recommendations on lymphangiograms, or giving opinions to co-workers; explaining opinions or dictating findings and recommendations.	330
Providing clinical training for radiology residents in lymphangiography procedures.	336
DIGESTIVE SYSTEM	
Salivary Glands	
Conducting sialography of any patient.	433
Reading, interpreting and making recommendations on sialography and related materials or giving opinions to co-workers; explaining opinions or dictating findings and recommendations.	434
Providing clinical training for radiology residents in ear, nose and throat radiography and sialography.	435
Gastrointestinal and Biliary Tracts	
Deciding on type of gastrointestinal and/or biliary radiographic examinations to order for any patient in consultation with referring physician and/or specialists.	339
Evaluating plain films of pediatric gastrointestinal tract to localize obstructions and/or foreign bodies.	450
Removing foreign object from pediatric upper esophagus under fluoroscopic control.	451

TASKS LISTED BY SYSTEM OF THE BODY (continued)

Category and Abbreviated Task Name	Task Code No.
DIGESTIVE SYSTEM	
Gastrointestinal and Biliary Tracts (continued)	
Conducting esophageal radiography of pediatric patient.	452
Conducting a radiographic barium swallow study of esophagus of any non-pediatric patient.	2
Conducting a radiographic barium study of upper gastrointestinal tract of pediatric patient.	453
Conducting a radiographic barium study of upper gastrointestinal tract of any non-pediatric patient.	3
Conducting a radiographic air contrast study of stomach of any non-pediatric patient.	395
Conducting small bowel enema radiographic study of any non-pediatric patient.	341
Conducting hypotonic duodenography of any non-pediatric patient.	340
Conducting a radiographic barium enema study of lower gastrointestinal tract of pediatric patient.	454
Conducting a radiographic barium enema study of lower gastrointestinal tract of any non-pediatric patient.	1
Conducting defecography of pediatric patient.	455
Conducting diagnosis and hydrostatic reduction of intussusception of pediatric patient.	456
Evaluating oral cholecystograms or oral cholangiograms; conducting fluoroscopy and/or post-fatty meal, post-evacuation study of any non-infant patient involved if so decided.	342
Conducting intravenous cholangiography and cholecystography (IVC) of any non-infant patient.	344

TASKS LISTED BY SYSTEM OF THE BODY (continued)

Category and Abbreviated Task Name	Task Code No.
DIGESTIVE SYSTEM	
Gastrointestinal and Biliary Tracts (continued)	
Conducting percutaneous (transhepatic) cholangiography of any non-pediatric patient.	343
Conducting T-tube cholangiography of any patient.	345
Reading, interpreting and making recommendations on radiographs of gastrointestinal and/or biliary tracts, or giving opinions to co-workers; explaining opinions or dictating findings and recommendations.	346
Participating in meetings of radiologists, surgeons and pathologists to discuss new developments, cases of interest and case problems in the field of gastrointestinal and biliary surgery and radiology.	352
Providing clinical training for radiology residents in radiographic study of the gastrointestinal and biliary tracts.	347
Planning and presenting lectures or case conferences on gastrointestinal and biliary tract radiology for radiology residents.	348
Planning and presenting lectures on gastrointestinal and biliary tract radiology for medical students.	349
Selecting gastrointestinal and biliary tract radiographic materials for use in case conference or lecture presentations or for inclusion in library.	310
Deciding on whether to enter suggested radiographs of gastrointestinal and biliary tracts into log book based on quality and educational value.	351

TASKS LISTED BY SYSTEM OF THE BODY (continued)

Category and Abbreviated Task Name	Task Code No.
MUSCULO-SKELETAL SYSTEM	
Deciding on and scheduling cleft palate radiological study for any patient.	333
Conducting a fluoroscopic and cineradiographic cleft palate study of any patient.	334
Reading, interpreting and making recommendations on cineradiographic cleft palate studies; explaining opinions, making presentation, or dictating findings and recommendations.	335
Conducting positive contrast arthrography (especially of knee) of any patient.	436
Reading and interpreting radiographs for bone-age study.	449
Reading, interpreting and making recommendations on orthopedic radiographs and/or arthrograms and related studies of bones and joints or giving opinions to clinicians or co-workers; explaining opinions or dictating findings and recommendations.	437
Participating in meetings of physicians involved with arthritis to discuss new developments, cases of interest and case problems in the field.	324
Providing clinical training for radiology residents in orthopedic radiology and arthrography.	438
NERVOUS SYSTEM	
Deciding on type of neuroradiologic procedure(s) to order for any patient in consultation with referring physician and/or neurologist.	396
Conducting cerebral angiography of any patient.	397

TASKS LISTED BY SYSTEM OF THE BODY (continued)

Category and Abbreviated Task Name	Task Code No.
NERVOUS SYSTEM (continued)	
Conducting retrograde venography of the internal jugular veins, posterior fossa dural sinus system and/or orbit of any patient.	427
Conducting orbital and/or cavernous sinus venography of any patient by frontal vein route.	428
Conducting pneumoencephalography of any patient.	398
Cooperating with surgeon in conducting brain ventriculography of any patient.	399
Conducting positive contrast posterior fossa myelography of any patient.	430
Directing skull tomography of any patient.	432
Directing computerized transverse axial tomography of the skull and brain of any patient.	440
Conducting selective spinal cord angiography of any patient.	429
Conducting positive contrast myelography of any patient.	400
Conducting air contrast myelography of any patient.	401
Conducting discography of any patient.	431
Reading, interpreting and making recommendations on neuroradiographic materials, and/or giving opinions to clinicians or co-workers; explaining opinions or dictating findings and recommendations.	404
Participating in meetings of radiologists, surgeons and neurologists to discuss new developments, cases of interest and case problems in the fields of neurology, surgery and neuroradiology.	408
Providing clinical training for radiology residents in neuroradiology procedures.	405

TASKS LISTED BY SYSTEM OF THE BODY (continued)

Category and Abbreviated Task Name	Task Code No.
NERVOUS SYSTEM (continued)	
Planning and presenting lectures or case conferences on neuroradiology for radiology residents.	407
REPRODUCTIVE AND URINARY SYSTEMS	
Breasts	
Conducting mammographic examination of any patient's breasts.	402
Reading, interpreting and making recommendations on mammographic materials, or giving opinions to co-workers; explaining opinions or dictating findings and recommendations.	403
Providing clinical training for radiology residents in mammography procedures.	406
Reproductive System and Fetus	
Deciding on type of gynecological radiographic procedures to order for non-pediatric female patient in consultation with referring physician.	421
Conducting vaginography of pediatric patient for intersex condition.	447
Conducting pelvic pneumography and/or pangynecography of non-infant female patient.	4
Conducting hysterography or hysterosalpingography of a non-pediatric female patient.	5

TASKS LISTED BY SYSTEM OF THE BODY (continued)

Category and Abbreviated Task Name	Task Code No.
REPRODUCTIVE AND URINARY SYSTEMS	
Reproductive System and Fetus (continued)	
Deciding on type of obstetrical radiographic procedures to order for pregnant patient in consultation with referring obstetrician.	418
Conducting intrauterine fetal radiography for intrauterine transfusion in consultation with obstetrician.	420
Calculating and interpreting radiographic pelvimetry using Colcher-Sussman technique.	419
Reading, interpreting and making recommendations on obstetrical and/or gynecological radiographic studies and related material or giving opinions to clinicians or co-workers; explaining opinions or dictating findings and recommendations.	422
Participating in meetings of radiologists, obstetricians, and gynecologists to discuss new developments, cases of interest and case problems of mutual interest.	423
Providing clinical training for radiology residents in obstetrical and gynecological radiographic procedures.	424
Planning and presenting lectures or case conferences on obstetrical and gynecological radiology for radiology residents.	425
Urinary System, Peritoneum	
Deciding on type of urographic procedure(s) to order for any patient in consultation with referring physician and/or specialists.	311
Conducting intravenous excretory urography (IVP) and inferior vena cavography of pediatric patient.	444
Conducting intravenous pyelography (IVP) examination of any non-pediatric patient.	312

TASKS LISTED BY SYSTEM OF THE BODY (continued)

Category and Abbreviated Task Name	Task Code No.
REPRODUCTIVE AND URINARY SYSTEMS	
Urinary System, Peritoneum (continued)	
Conducting percutaneous antegrade pyelography of any non-pediatric patient.	426
Directing nephrotomography of any patient.	313
Performing renal cyst puncture and conducting related radiography of any patient.	315
Assisting in renal biopsy of any patient by using fluoroscopy to place biopsy needle.	316
Conducting retrograde voiding cystourethrography of pediatric patient.	445
Conducting percutaneous peritoneography/inguinal herniography of pediatric patient.	448
Reading, interpreting and making recommendations on urographic materials, or giving opinions to co-workers; explaining opinions or dictating findings and recommendations.	317
Participating in meetings of radiologists, urologists and nephrologists to discuss new developments, cases of interest, and case problems in the fields of urology and urography.	323
Providing clinical training for radiology residents in urographic procedures.	318
RESPIRATORY SYSTEM	
Deciding on type of respiratory radiographic examination(s) to order for any patient in consultation with referring physician and/or specialists.	409
Conducting choanal radiography of pediatric patient.	442

TASKS LISTED BY SYSTEM OF THE BODY (continued)

Category and Abbreviated Task Name	Task Code No.
RESPIRATORY SYSTEM (continued)	
Conducting laryngography of any non-pediatric patient.	412
Conducting fluoroscopic inspiration-expiration examination of pediatric patient.	457
Conducting bronchoscopy and related biopsy and secretion sampling of any non-pediatric patient.	410
Conducting bronchography of pediatric patient in consultation with pediatrician(s) and anesthesiologist.	443
Conducting bronchography of any non-pediatric patient.	411
Directing respiratory tract tomography.	20
Conducting aspiration or tissue needle biopsy of the lung of any non-pediatric patient.	413
Reading, interpreting and making recommendations on radiographic materials involving bronchi, lungs, trachea and/or larynx, or giving opinions to co-workers; explaining opinions or dictating findings and recommendations.	414
Participating in meetings with pulmonary specialists, surgeons and pathologists to discuss new developments, cases of interest, and case problems in pulmonary medicine, surgical pathology and thoracic surgery.	337
Providing clinical training for radiology residents in radiographic procedures of lungs, bronchi, trachea and/or larynx.	416
Planning and presenting lectures or case conferences on pulmonary, tracheal, bronchial and laryngeal radiology for radiology residents.	415
Planning and presenting lectures on pulmonary, bronchial, tracheal and laryngeal radiography for medical students.	417

TASK LISTED BY SYSTEM OF THE BODY (continued)

Category and Abbreviated Task Name	Task Code No.
GENERAL TASKS n.e.c.*	
Conducting radiography of external fistula or sinus tract of any patient.	446
Reading, interpreting and making recommendations on routine radiographic materials; dictating findings and recommendations.	6
Pediatrics n.e.c.	
Deciding on type of pediatric radiographic examination(s) to order for pediatric patient in consultation with referring physician and/or pediatric specialist.	441
Reading, interpreting and making recommendations on radiographic and related studies of pediatric patients or giving opinions to clinician or co-workers; explaining opinions or dictating findings and recommendations.	458
Participating in meetings of radiologists, surgeons and pediatricians to discuss new developments, cases of interest, and case problems in the field of pediatric surgery and radiology.	459
Providing clinical training for radiology residents in pediatric radiography.	460
Planning and presenting lectures or case conferences on pediatric radiology for radiology residents.	461
Planning and presenting lectures on pediatric radiology for medical students.	462

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* N.e.c.: Not elsewhere classified.

Category and Abbreviated Task Name	Task Code No.
GENERAL TASKS n.e.c.	
Tomography n.e.c.	
Deciding whether to order non-neurologic tomography for any patient or alternative studies and recommending technique in consultation with referring physician.	331
Reading, interpreting and making recommendations on non-neurological tomograms or giving opinions to co-workers; explaining opinions or dictating findings and recommendations.	332
Deciding whether to order non-neurologic computerized transverse axial tomography for any patient and/or alternative studies in consultation with referring physician.	314
Directing computerized transverse axial tomography of the body of any patient.	488
Reading, interpreting and making recommendations on non-neurological computerized transverse axial tomographic scans of the body, and/or giving opinions to clinicians or co-workers; explaining opinions or dictating findings and recommendations.	489
Professional Meetings and Teaching n.e.c.	
Participating in meetings of physicians involved with plastic surgery to discuss new developments, cases of interest, and case problems in the field.	338
Participating in meetings of radiologists, surgeons and pathologists to discuss new developments, cases of interest and case problems in the fields of surgery and radiology.	325
Participating in diagnostic radiology departmental meeting.	326
Planning and presenting lectures on assigned aspects of radiology for medical students.	320

TASKS LISTED BY SYSTEM OF THE BODY (continued)

Category and Abbreviated Task Name	Task Code No.
GENERAL TASKS n.e.c.	
Professional Meetings and Teaching n.e.c. (continued)	
Participating in radiologists meeting to arrive at overall clinical and academic assessments of residents in radiology.	321
Conducting counseling on professional or personal problems with residents in radiology.	350
Selecting and assembling radiographs and related case history information for use in case conference in diagnostic radiology.	391
Reviewing and selecting current and/or inactive radiographs for instructional use.	393
Planning and presenting cases and/or related lectures on diagnostic radiology and pathology to pathologists, radiologists and residents.	392
Deciding on diagnostic radiology library acquisitions of books, journals and radiographic materials; coding library acquisitions.	322
Research	
Formulating a problem for clinical research in diagnostic radiology.	66
Conducting literature review for clinical research problem in diagnostic radiology.	67
Comparing prior radiographic diagnoses with later pathology and/or autopsy reports and reporting discrepancies to appropriate radiologists.	394
Preparing research design in clinical diagnostic radiology; supervising research; analyzing, evaluating results; and preparing report.	68

TASKS LISTED BY TASK FUNCTION

Category and Abbreviated Task Name	Task Code No.
"CONSULTATION" TASKS	
Deciding on type of non-neurologic angiography procedure to order for any patient in consultation with referring physician, surgeon, and/or other specialist.	469
Deciding whether to order lymphangiography of any patient or alternative studies and recommending technique, in consultation with referring physician.	328
Deciding on type of gastrointestinal and/or biliary radiographic examinations to order for any patient in consultation with referring physician and/or specialists.	339
Deciding on and scheduling cleft palate radiological study for any patient.	333
Deciding on type of neuroradiologic procedure(s) to order for any patient in consultation with referring physician and/or neurologist.	396
Deciding on type of gynecological radiographic procedures to order for non-pediatric female patient in consultation with referring physician.	421
Deciding on type of obstetrical radiographic procedures to order for pregnant patient in consultation with referring obstetrician.	418
Deciding on type of urographic procedure(s) to order for any patient in consultation with referring physician and/or specialists.	311
Deciding on type of respiratory radiographic examination(s) to order for any patient in consultation with referring physician and/or specialists.	409
Deciding on type of pediatric radiographic examination(s) to order for pediatric patient in consultation with referring physician and/or pediatric specialist.	441

Category and Abbreviated Task Name	Task Code No.
"CONSULTATION" TASKS (continued)	
Deciding whether to order non-neurologic tomography for any patient or alternative studies,and recommending technique in consultation with referring physician.	331
Deciding whether to order non-neurologic computerized transverse axial tomography for any patient and/or alternative studies in consultation with referring physician.	314
"HANDS ON" PROCEDURE TASKS,BY SPECIALTY	
Angiography	
Conducting lymphangiography of any patient.	329
Conducting peripheral arteriography of any patient by percutaneous selective catheterization or direct needle puncture.	470
Conducting ascending or descending venography of lower extremities of any patient by direct needle puncture.	471
Conducting catheter thoracic aortography of any patient.	472
Conducting catheter abdominal aortography and/or selective visceral arteriography of any patient.	473
Conducting percutaneous translumbar abdominal aortography of any patient.	474
Conducting percutaneous splenoportography of any patient.	475
Conducting selective pelvic arteriography of non-pediatric gravid or nongravid female patient.	476
Conducting catheter pulmonary angiography of any patient.	477
Conducting selective bronchial arteriography of any patient.	478

Category and Abbreviated Task Name	Task Code No.
"HANDS ON" PROCEDURE TASKS	
Angiography (continued)	
Conducting selective thyroid angiography of any patient.	479
Conducting selective subclavian arteriography of any non-pediatric patient to evaluate thoracic outlet syndrome.	480
Conducting intravenous angiocardiography of any patient by percutaneous selective catheterization or direct needle puncture.	481
Conducting catheter vena cavography and/or selective renal or adrenal venography of any non-infant patient.	482
Conducting percutaneous coronary arteriography and/or left ventriculography of any patient.	483
Gastrointestinal and Biliary	
Conducting a radiographic barium swallow study of esophagus of any non-pediatric patient.	2
Conducting a radiographic barium study of upper gastrointestinal tract of any non-pediatric patient.	3
Conducting a radiographic air contrast study of stomach of any non-pediatric patient.	395
Conducting small bowel enema radiographic study of any non-pediatric patient.	341
Conducting hypotonic duodenography of any non-pediatric patient.	340
Conducting a radiographic barium enema study of lower gastrointestinal tract of any non-pediatric patient.	1

TASKS LISTED BY TASK FUNCTION (continued)

Category and Abbreviated Task Name	Task Code No.
"HANDS ON" PROCEDURE TASKS	
Gastrointestinal and Biliary (continued)	
Evaluating oral cholecystograms or oral cholangiograms; conducting fluoroscopy and/or post-fatty meal, post-evacuation study of any non-infant patient involved if so decided.	342
Conducting intravenous cholangiography and cholecystography (IVC) of any non-infant patient.	344
Conducting percutaneous (transhepatic) cholangiography of any non-pediatric patient.	343
Conducting T-tube cholangiography of any patient.	345
Neuroradiology	
Conducting cerebral angiography of any patient.	397
Conducting retrograde venography of the internal jugular veins, posterior fossa dural sinus system and/or orbit of any patient.	427
Conducting orbital and/or cavernous sinus venography of any patient by frontal vein route.	428
Conducting pneumoencephalography of any patient.	398
Cooperating with surgeon in conducting brain ventriculography of any patient.	399
Conducting positive contrast posterior fossa myelography of any patient.	430
Directing skull tomography of any patient.	432
Directing computerized transverse axial tomography of the skull and brain of any patient.	440

TASKS LISTED BY TASK FUNCTION (continued)

"HANDS ON" PROCEDURE TASKS

Neuroradiology (continued)

Category and Abbreviated Task Name	Task Code No.
Conducting selective spinal cord angiography of any patient.	429
Conducting positive contrast myelography of any patient.	400
Conducting air contrast myelography of any patient.	401
Conducting discography of any patient.	431

Pediatrics

Category and Abbreviated Task Name	Task Code No.
Conducting choanal radiography of pediatric patient.	442
Conducting fluoroscopic inspiration-expiration examination of pediatric patient.	457
Conducting bronchography of pediatric patient in consultation with pediatrician(s) and anesthesiologist.	443
Removing foreign object from pediatric upper esophagus under fluoroscopic control.	451
Conducting esophageal radiography of pediatric patient.	452
Conducting radiographic barium study of upper gastrointestinal tract of pediatric patient.	453
Conducting a radiographic barium enema study of lower gastrointestinal tract of pediatric patient.	454
Conducting defecography of pediatric patient.	455
Conducting diagnosis and hydrostatic reduction of intussusception of pediatric patient.	456

Category and Abbreviated Task Name	Task Code No.
"HANDS ON" PROCEDURE TASKS	
Pediatrics (continued)	
Conducting intravenous excretory urography (IVP) and inferior vena cavography of pediatric patient.	444
Conducting retrograde voiding cystourethrography of pediatric patient.	445
Conducting vaginography of pediatric patient for intersex condition.	447
Conducting percutaneous peritoneography/inguinal herniography of pediatric patient.	448
Respiratory	
Conducting laryngography of any non-pediatric patient.	412
Conducting bronchoscopy and related biopsy and secretion sampling of any non-pediatric patient.	410
Conducting bronchography of any non-pediatric patient.	411
Conducting aspiration or tissue needle biopsy of the lung of any non-pediatric patient.	413
Directing respiratory tract tomography.	20
Urography	
Conducting intravenous pyelography (IVP) examination of any non-pediatric patient.	312

TASKS LISTED BY TASK FUNCTION (continued)

"HANDS ON" PROCEDURE TASKS

Urography (continued)

Category and Abbreviated Task Name	Task Code No.
Conducting percutaneous antegrade pyelography of any non-pediatric patient.	426
Performing renal cyst puncture and conducting related radiography of any patient.	315
Assisting in renal biopsy of any patient by using fluoroscopy to place biopsy needle.	316
Directing nephrotomography of any patient.	313

Obstetrics-Gynecology

Category and Abbreviated Task Name	Task Code No.
Conducting intrauterine fetal radiography for intrauterine transfusion in consultation with obstetrician.	420
Conducting pelvic pneumography and/or pangynecography of non-infant female patient.	4
Conducting hysterography or hysterosalpingography of a non-pediatric female patient.	5

Procedure Tasks n.e.c.

Category and Abbreviated Task Name	Task Code No.
Conducting a fluoroscopic and cineradiographic cleft palate study of any patient.	334
Conducting sialography of any patient.	433
Conducting mammographic examination of any patient's breasts.	402

TASKS LISTED BY TASK FUNCTION (continued)

Category and Abbreviated Task Name	Task Code No.
"HANDS ON" PROCEDURE TASKS	
Procedure Tasks n.e.c. (continued)	
Conducting positive contrast arthrography (especially of knee) of any patient.	436
Conducting radiography of external fistula or sinus tract of any patient.	446
Directing computerized transverse axial tomography of the body of any patient.	488
"READING AND INTERPRETING" TASKS	
Reading, interpreting and making recommendations on non-neurologic angiographic and related studies and/or giving opinions to clinicians or co-workers; explaining opinions or dictating findings and recommendations.	484
Reading, interpreting and making recommendations on lymphangiograms, or giving opinions to co-workers; explaining opinions or dictating findings and recommendations.	330
Reading, interpreting and making recommendations on sialography and related materials or giving opinions to co-workers; explaining opinions or dictating findings and recommendations.	434
Reading, interpreting and making recommendations on radiographs of gastrointestinal and/or biliary tracts, or giving opinions to co-workers; explaining opinions or dictating findings and recommendations.	346
Reading, interpreting and making recommendations on orthopedic radiographs and/or arthrograms and related studies of bones and joints or giving opinions to clinicians or co-workers; explaining opinions or dictating findings and recommendations.	437

TASKS LISTED BY TASK FUNCTION (continued)

"READING AND INTERPRETING" TASKS (continued)

Category and Abbreviated Task Name	Task Code No.
Reading, interpreting and making recommendations on cineradiographic cleft palate studies; explaining opinions, making presentation, or dictating findings and recommendations.	335
Reading, interpreting and making recommendations on neuroradiographic materials, and/or giving opinions to clinicians or co-workers; explaining opinions or dictating findings and recommendations.	404
Reading and interpreting radiographs for bone-age study.	449
Evaluating plain films of pediatric gastrointestinal tract to localize obstructions and/or foreign bodies.	450
Reading, interpreting and making recommendations on radiographic and related studies of pediatric patients or giving opinions to clinicians or co-workers; explaining opinions or dictating findings and recommendations.	458
Reading, interpreting and making recommendations on mammographic materials, or giving opinions to co-workers; explaining opinions or dictating findings and recommendations.	403
Calculating and interpreting radiographic pelvimetry using Colcher-Sussman technique.	419
Reading, interpreting and making recommendations on obstetrical and/or gynecological radiographic studies and related material or giving opinions to clinicians or co-workers; explaining opinions or dictating findings and recommendations.	422
Reading, interpreting and making recommendations on urographic materials, or giving opinions to co-workers; explaining opinions or dictating findings and recommendations.	317
Reading, interpreting and making recommendations on radiographic materials involving bronchi, lungs, trachea and/or larynx, or giving opinions to co-workers; explaining opinions or dictating findings and recommendations.	414

TASKS LISTED BY TASK FUNCTION (continued)

Category and Abbreviated Task Name	Task Code No.
"READING AND INTERPRETING" TASKS (continued)	
Reading, interpreting and making recommendations on non-neurological tomograms or giving opinions to co-workers; explaining opinions or dictating findings and recommendations.	332
Reading, interpreting and making recommendations on non-neurological computerized transverse axial tomographic scans of the body, and/or giving opinions to clinicians or co-workers; explaining opinions or dictating findings and recommendations.	489
Reading, interpreting and making recommendations on routine radiographic materials; dictating findings and recommendations.	6
"PROFESSIONAL MEETING" TASKS	
Participating in meetings of angiographers, vascular surgeons and cardiologists to discuss new developments, cases of interest, and case problems in the field of angiography, vascular and cardiovascular surgery.	485
Participating in meetings of radiologists, surgeons and pathologists to discuss new developments, cases of interest and case problems in the field of gastrointestinal and biliary surgery and radiology.	352
Participating in meetings of physicians involved with arthritis to discuss new developments, cases of interest and case problems in the field.	324
Participating in meetings of physicians involved with plastic surgery to discuss new developments, cases of interest, and case problems in the field.	338
Participating in meetings of radiologists, surgeons and neurologists to discuss new developments, cases of interest and case problems in the fields of neurology, surgery and neuroradiology.	408

Category and Abbreviated Task Name	Task Code No.
"PROFESSIONAL MEETING" TASKS (continued)	
Participating in meetings of radiologists, surgeons and pediatricians to discuss new developments, cases of interest, and case problems in the field of pediatric surgery and radiology.	459
Participating in meetings of radiologists, obstetricians, and gynecologists to discuss new developments, cases of interest and case problems of mutual interest.	423
Participating in meetings of radiologists, urologists and nephrologists to discuss new developments, cases of interest, and case problems in the fields of urology and urography.	323
Participating in meetings with pulmonary specialists, surgeons and pathologists to discuss new developments, cases of interest, and case problems in pulmonary medicine, surgical pathology and thoracic surgery.	337
Participating in meetings of radiologists, surgeons and pathologists to discuss new developments, cases of interest and case problems in the fields of surgery and radiology.	325
"TEACHING" TASKS	
Clinical Training	
Providing clinical training for radiology residents in nonneurologic angiography.	486
Providing clinical training for radiology residents in lymphangiography procedures.	336
Providing clinical training for radiology residents in ear, nose and throat radiography and sialography.	435

TASKS LISTED BY TASK FUNCTION (continued)

Category and Abbreviated Task Name	Task Code No.
"TEACHING" TASKS	
Clinical Training (continued)	
Providing clinical training for radiology residents in radiographic study of the gastrointestinal and biliary tracts.	347
Providing clinical training for radiology residents in orthopedic radiology and arthrography.	438
Providing clinical training for radiology residents in neuroradiology procedures.	405
Providing clinical training for radiology residents in pediatric radiography.	460
Providing clinical training for radiology residents in mammography procedures.	406
Providing clinical training for radiology residents in obstetrical and gynecological radiographic procedures.	424
Providing clinical training for radiology residents in urographic procedures.	318
Providing clinical training for radiology residents in radiographic procedures of lungs, bronchi, trachea and/or larynx.	416
Case Conferences and Lectures	
Planning and presenting lectures or case conferences on nonneurologic angiography for radiology residents.	487
Planning and presenting lectures or case conferences on gastrointestinal and biliary tract radiology for radiology residents.	348

TASKS LISTED BY TASK FUNCTION (continued)

Category and Abbreviated Task Name	Task Code No.
"TEACHING" TASKS	
Case Conferences and Lectures (continued)	
Planning and presenting lectures on gastrointestinal and biliary tract radiology for medical students.	349
Planning and presenting lectures or case conferences on neuroradiology for radiology residents.	407
Planning and presenting lectures or case conferences on pediatric radiology for radiology residents.	461
Planning and presenting lectures on pediatric radiology for medical students.	462
Planning and presenting lectures or case conferences on obstetrical and gynecological radiology for radiology residents.	425
Planning and presenting lectures or case conferences on pulmonary, tracheal, bronchial and laryngeal radiology for radiology residents.	415
Planning and presenting lectures on pulmonary, bronchial, tracheal and laryngeal radiography for medical students.	417
Planning and presenting cases and/or related lectures on diagnostic radiology and pathology to pathologists, radiologists and residents.	392
Planning and presenting lectures on assigned aspects of radiology for medical students.	320
Preparation	
Selecting gastrointestinal and biliary tract radiographic materials for use in case conference or lecture presentations or for inclusion in library.	310

TASKS LISTED BY TASK FUNCTION (continued)

Category and Abbreviated Task Name	Task Code No.
"TEACHING" TASKS	
Preparation (continued)	
Selecting and assembling radiographs and related case history information for use in case conference in diagnostic radiology.	391
Deciding on whether to enter suggested radiographs of gastrointestinal and biliary tracts into log book based on quality and educational value.	351
Deciding on diagnostic radiology library acquisition of books, journals and radiographic materials; coding library acquisitions.	322
Reviewing and selecting current and/or inactive radiographs for instructional use.	393
Evaluation and Counseling	
Participating in radiologists meeting to arrive at overall clinical and academic assessments of residents in radiology.	321
Conducting counseling on professional or personal problems with residents in radiology.	350
"DEPARTMENT" AND "QUALITY" TASKS	
Comparing prior radiographic diagnoses with later pathology and/or autopsy reports and reporting discrepancies to appropriate radiologists.	394
Participating in diagnostic radiology departmental meeting.	326

TASKS LISTED BY TASK FUNCTION (continued)

Category and Abbreviated Task Name	Task Code No.
RESEARCH TASKS	
Formulating a problem for clinical research in diagnostic radiology.	66
Conducting literature review for clinical research problem in diagnostic radiology.	67
Preparing research design in clinical diagnostic radiology; supervising research; analyzing, evaluating results; and preparing report.	68

TASKS LISTED BY TYPE OF MAIN RECIPIENT, RESPONDENT OR CO-WORKER

Category and Abbreviated Task Name	Task Code No.
TASKS WITH PATIENT RECIPIENT	
Any Patient	
Conducting peripheral arteriography of any patient by percutaneous selective catheterization or direct needle puncture.	470
Conducting ascending or descending venography of lower extremities of any patient by direct needle puncture.	471
Conducting catheter thoracic aortography of any patient.	472
Conducting catheter abdominal aortography and/or selective visceral arteriography of any patient.	473
Conducting percutaneous translumbar abdominal aortography of any patient.	474
Conducting percutaneous splenoportography of any patient.	475
Conducting catheter pulmonary angiography of any patient.	477
Conducting selective bronchial arteriography of any patient.	478
Conducting selective thyroid angiography of any patient.	479
Conducting intravenous angiocardiography of any patient by percutaneous selective catheterization or direct needle puncture.	481
Conducting percutaneous coronary arteriography and/or left ventriculography of any patient.	483
Conducting lymphangiography of any patient.	329
Conducting sialography of any patient.	433
Conducting T-tube cholangiography of any patient.	345
Conducting a fluoroscopic and cineradiographic cleft palate study of any patient.	334

TASKS LISTED BY TYPE OF MAIN RECIPIENT, RESPONDENT OR CO-WORKER (continued)

Category and Abbreviated Task Name	Task Code No.
TASKS WITH PATIENT RECIPIENT	
Any Patient (continued)	
Conducting positive contrast arthrography (especially of knee) of any patient.	436
Conducting cerebral angiography of any patient.	397
Conducting retrograde venography of the internal jugular veins, posterior fossa dural sinus system and/or orbit of any patient.	427
Conducting orbital and/or cavernous sinus venography of any patient by frontal vein route.	428
Conducting pneumoencephalography of any patient.	398
Cooperating with surgeon in conducting brain ventriculography of any patient.	399
Conducting positive contrast posterior fossa myelography of any patient.	430
Directing skull tomography of any patient.	432
Directing computerized transverse axial tomography of the skull and brain of any patient.	440
Conducting selective spinal cord angiography of any patient.	429
Conducting positive contrast myelography of any patient.	400
Conducting air contrast myelography of any patient.	401
Conducting discography of any patient.	431
Conducting mammographic examination of any patient's breasts.	402
Directing nephrotomography of any patient.	313

TASKS LISTED BY TYPE OF MAIN RECIPIENT, RESPONDENT OR CO-WORKER (continued)

Category and Abbreviated Task Name	Task Code No.
TASKS WITH PATIENT RECIPIENT	
Any Patient (continued)	
Performing renal cyst puncture and conducting related radiography of any patient.	315
Assisting in renal biopsy of any patient by using fluoroscopy to place biopsy needle.	316
Conducting radiography of external fistula or sinus tract of any patient.	446
Directing computerized transverse axial tomography of the body of any patient.	488
Any Non-Infant Patient	
Conducting catheter vena cavography and/or selective renal or adrenal venography of any non-infant patient.	482
Evaluating oral cholecystograms or oral cholangiograms; conducting fluoroscopy and/or post-fatty meal, post-evacuation study of any non-infant patient involved if so decided.	342
Conducting intravenous cholangiography and cholecystography (IVC) of any non-infant patient.	344
Any Non-Pediatric Patient	
Conducting selective subclavian arteriography of any non-pediatric patient to evaluate thoracic outlet syndrome.	480
Conducting a radiographic barium swallow study of esophagus of any non-pediatric patient.	2

TASKS LISTED BY TYPE OF MAIN RECIPIENT, RESPONDENT OR CO-WORKER (continued)

Category and Abbreviated Task Name	Task Code No.
TASKS WITH PATIENT RECIPIENT	
Any Non-Pediatric Patient (continued)	
Conducting a radiographic barium study of upper gastrointestinal tract of any non-pediatric patient.	3
Conducting a radiographic air contrast study of stomach of any non-pediatric patient.	395
Conducting small bowel enema radiographic study of any non-pediatric patient.	341
Conducting hypotonic duodenography of any non-pediatric patient.	340
Conducting a radiographic barium enema study of lower gastrointestinal tract of any non-pediatric patient.	1
Conducting percutaneous (transhepatic) cholangiography of any non-pediatric patient.	343
Conducting laryngography of any non-pediatric patient.	412
Conducting bronchoscopy and related biopsy and secretion sampling of any non-pediatric patient.	410
Conducting bronchography of any non-pediatric patient.	411
Conducting aspiration or tissue needle biopsy of the lung of any non-pediatric patient.	413
Conducting intravenous pyelography (IVP) examination of any non-pediatric patient.	312
Conducting percutaneous antegrade pyelography of any non-pediatric patient.	426

TASKS LISTED BY TYPE OF MAIN RECIPIENT, RESPONDENT OR CO-WORKER (continued)

Category and Abbreviated Task Name	Task Code No.
TASKS WITH PATIENT RECIPIENT	
Female Patient	
Conducting pelvic pneumography and/or pangynecography of non-infant female patient.	4
Conducting selective pelvic arteriography of non-pediatric gravid or nongravid female patient.	476
Conducting hysterography or hysterosalpingography of a non-pediatric female patient.	5
Conducting intrauterine fetal radiography for intrauterine transfusion in consultation with obstetrician.	420
Pediatric Patient	
Conducting choanal radiography of pediatric patient.	442
Conducting fluoroscopic inspiration-expiration examination of pediatric patient.	457
Conducting bronchography of pediatric patient in consultation with pediatrician(s) and anesthesiologist.	443
Removing foreign object from pediatric upper esophagus under fluoroscopic control.	451
Conducting esophageal radiography of pediatric patient.	452
Conducting radiographic barium study of upper gastrointestinal tract of pediatric patient.	453
Conducting a radiographic barium enema study of lower gastrointestinal tract of pediatric patient.	454
Conducting defecography of pediatric patient.	455

TASKS LISTED BY TYPE OF MAIN RECIPIENT, RESPONDENT OR CO-WORKER (continued)

Category and Abbreviated Task Name	Task Code No.

TASKS WITH PATIENT RECIPIENT

Pediatric Patient (continued)

Category and Abbreviated Task Name	Task Code No.
Conducting diagnosis and hydrostatic reduction of intussusception of pediatric patient.	456
Conducting intravenous excretory urography (IVP) and inferior vena cavography of pediatric patient.	444
Conducting retrograde voiding cystourethrography of pediatric patient.	445
Conducting vaginography of pediatric patient for intersex condition.	447
Conducting percutaneous peritoneography/inguinal herniography of pediatric patient.	448

TASKS WITH PHYSICIAN MAIN RECIPIENT, RESPONDENT or CO-WORKER

Physician Recipient

Category and Abbreviated Task Name	Task Code No.
Reading, interpreting and making recommendations on non-neurologic angiographic and related studies and/or giving opinions to clinicians or co-workers; explaining opinions or dictating findings and recommendations.	484
Reading, interpreting and making recommendations on lymphangiograms, or giving opinions to co-workers; explaining opinions or dictating findings and recommendations.	330
Reading, interpreting and making recommendations on sialography and related materials or giving opinions to co-workers; explaining opinions or dictating findings and recommendations.	434

TASKS LISTED BY TYPE OF MAIN RECIPIENT, RESPONDENT OR CO-WORKER (continued)

Category and Abbreviated Task Name	Task Code No.
TASKS WITH PHYSICIAN MAIN RECIPIENT, RESPONDENT OR CO-WORKER	
Physician Recipient (continued)	
Reading, interpreting and making recommendations on radiographs of gastrointestinal and/or biliary tracts, or giving opinions to co-workers; explaining opinions or dictating findings and recommendations.	346
Evaluating plain films of pediatric gastrointestinal tract to localize obstructions and/or foreign bodies.	450
Reading, interpreting and making recommendations on cineradiographic cleft palate studies; explaining opinions, making presentation, or dictating findings and recommendations.	335
Reading, interpreting and making recommendations on orthopedic radiographs and/or arthrograms and related studies of bones and joints or giving opinions to clinicians or co-workers; explaining opinions or dictating findings and recommendations.	437
Reading, interpreting and making recommendations on neuroradiographic materials, and/or giving opinions to clinicians or co-workers; explaining opinions or dictating findings and recommendations.	404
Reading, interpreting and making recommendations on radiographic and related studies of pediatric patients or giving opinions to clinicians or co-workers; explaining opinions or dictating findings and recommendations.	458
Reading, interpreting and making recommendations on mammographic materials, or giving opinions to co-workers; explaining opinions or dictating findings and recommendations.	403
Reading, interpreting and making recommendations on obstetrical and/or gynecological radiographic studies and related material or giving opinions to clinicians or co-workers; explaining opinions or dictating findings and recommendations.	422
Calculating and interpreting radiographic pelvimetry using Colcher-Sussman technique.	419

TASKS LISTED BY TYPE OF MAIN RECIPIENT, RESPONDENT OR CO-WORKER (Continued)

Category and Abbreviated Task Name	Task Code No.
TASKS WITH PHYSICIAN MAIN RECIPIENT, RESPONDENT OR CO-WORKER	
Physician Recipient (continued)	
Reading, interpreting and making recommendations on urographic materials, or giving opinions to co-workers; explaining opinions or dictating findings and recommendations.	317
Reading, interpreting and making recommendations on radiographic materials involving bronchi, lungs, trachea and/or larynx, or giving opinions to co-workers; explaining opinions or dictating findings and recommendations.	414
Reading, interpreting and making recommendations on non-neurological tomograms or giving opinions to co-workers; explaining opinions or dictating findings and recommendations.	332
Reading, interpreting and making recommendations on non-neurological computerized transverse axial tomographic scans of the body, and/or giving opinions to clinicians or co-workers; explaining opinions or dictating findings and recommendations.	489
Reading, interpreting and making recommendations on routine radiographic materials; dictating findings and recommendations.	6
Comparing prior radiographic diagnoses with later pathology and/or autopsy reports and reporting discrepancies to appropriate radiologists.	394
Physician Respondent	
Deciding on type of non-neurologic angiography procedure to order for any patient in consultation with referring physician, surgeon, and/or other specialist.	469
Deciding whether to order lymphangiography of any patient or alternative studies and recommending technique, in consultation with referring physician.	328

TASKS WITH PHYSICIAN MAIN RECIPIENT, RESPONDENT OR CO-WORKER

Physician Respondent (continued)

Category and Abbreviated Task Name	Task Code No.
Deciding on type of gastrointestinal and/or biliary radiographic examinations to order for any patient in consultation with referring physician and/or specialists.	339
Deciding on type of neuroradiologic procedure(s) to order for any patient in consultation with referring physician and/or neurologist.	396
Deciding on type of pediatric radiographic examination(s) to order for pediatric patient in consultation with referring physician and/or pediatric specialist.	441
Deciding on type of obstetrical radiographic procedures to order for pregnant patient in consultation with referring obstetrician.	418
Deciding on type of gynecological radiographic procedures to order for non-pediatric female patient in consultation with referring physician.	421
Deciding on type of urographic procedure(s) to order for any patient in consultation with referring physician and/or specialists.	311
Deciding on type of respiratory radiographic examination(s) to order for any patient in consultation with referring physician and/or specialists.	409
Deciding whether to order non-neurologic tomography for any patient or alternative studies and recommending technique in consultation with referring physician.	331
Deciding whether to order non-neurologic computerized transverse axial tomography for any patient and/or alternative studies in consultation with referring physician.	314

Category and Abbreviated Task Name	Task Code No.
TASKS WITH PHYSICIAN MAIN RECIPIENT, RESPONDENT OR CO-WORKER	
Physician Co-workers	
Participating in meetings of angiographers, vascular surgeons and cardiologists to discuss new developments, cases of interest, and case problems in the field of angiography, vascular and cardiovascular surgery.	485
Participating in meetings of radiologists, surgeons and pathologists to discuss new developments, cases of interest and case problems in the field of gastrointestinal and biliary surgery and radiology.	352
Participating in meetings of physicians involved with plastic surgery to discuss new developments, cases of interest, and case problems in the field.	338
Participating in meetings of physicians involved with arthritis to discuss new developments, cases of interest and case problems in the field.	324
Participating in meetings of radiologists, surgeons and neurologists to discuss new developments, cases of interest and case problems in the fields of neurology, surgery and neuroradiology.	408
Participating in meetings of radiologists, surgeons and pediatricians to discuss new developments, cases of interest, and case problems in the field of pediatric surgery and radiology.	459
Participating in meetings of radiologists, obstetricians, and gynecologists to discuss new developments, cases of interest and case problems of mutual interest.	423
Participating in meetings of radiologists, urologists and nephrologists to discuss new developments, cases of interest, and case problems in the fields of urology and urography.	323

TASKS LISTED BY TYPE OF MAIN RECIPIENT, RESPONDENT OR CO-WORKER (continued)

Category and Abbreviated Task Name	Task Code No.
TASKS WITH PHYSICIAN MAIN RECIPIENT, RESPONDENT OR CO-WORKER	
Physician Co-workers (continued)	
Participating in meetings with pulmonary specialists, surgeons and pathologists to discuss new developments, cases of interest, and case problems in pulmonary medicine, surgical pathology and thoracic surgery.	337
Participating in meetings of radiologists, surgeons and pathologists to discuss new developments, cases of interest and case problems in the fields of surgery and radiology.	325
Participating in diagnostic radiology departmental meeting.	326
Participating in radiologists meeting to arrive at overall clinical and academic assessments of residents in radiology.	321
TASKS WITH STUDENT MAIN RECIPIENTS	
Residents	
Providing clinical training for radiology residents in non-neurologic angiography.	486
Providing clinical training for radiology residents in lymphangiography procedures.	336
Planning and presenting lectures or case conferences on non-neurologic angiography for radiology residents.	487
Providing clinical training for radiology residents in ear, nose and throat radiography and sialography.	435
Providing clinical training for radiology residents in radiographic study of the gastrointestinal and biliary tracts.	347

TASKS LISTED BY TYPE OF MAIN RECIPIENT, RESPONDENT OR CO-WORKER (continued)

Category and Abbreviated Task Name	Task Code No.
TASKS WITH STUDENT MAIN RECIPIENTS	
Residents (continued)	
Planning and presenting lectures or case conferences on gastrointestinal and biliary tract radiology for radiology residents.	348
Providing clinical training for radiology residents in orthopedic radiology and arthrography.	438
Providing clinical training for radiology residents in neuroradiology procedures.	405
Planning and presenting lectures or case conferences on neuroradiology for radiology residents.	407
Providing clinical training for radiology residents in pediatric radiography.	460
Planning and presenting lectures or case conferences on pediatric radiology for radiology residents.	461
Providing clinical training for radiology residents in mammography procedures.	406
Providing clinical training for radiology residents in obstetrical and gynecological radiology for radiology residents.	424
Planning and presenting lectures or case conferences on obstetrical and gynecological radiology for radiology residents.	425
Providing clinical training for radiology residents in urographic procedures.	318
Providing clinical training for radiology residents in radiographic procedures of lungs, bronchi, trachea and/or larynx.	416
Planning and presenting lectures or case conferences on pulmonary, tracheal, bronchial and laryngeal radiology for radiology residents.	415

TASKS LISTED BY TYPE OF MAIN RECIPIENT, RESPONDENT OR CO-WORKER (continued)

Category and Abbreviated Task Name	Task Code No.
TASKS WITH STUDENT MAIN RECIPIENTS	
Residents (continued)	
Planning and presenting cases and/or related lectures on diagnostic radiology and pathology to pathologists, radiologists and residents.	392
Conducting counseling on professional or personal problems with residents in radiology.	350
Medical Students	
Planning and presenting lectures on gastrointestinal and biliary tract radiology for medical students.	349
Planning and presenting lectures on pediatric radiology for medical students.	462
Planning and presenting lectures on pulmonary, bronchial, tracheal and laryngeal radiography for medical students.	417
Planning and presenting lectures on assigned aspects of radiology for medical students.	320
MISCELLANEOUS	
Deciding on and scheduling cleft palate radiological study for any patient.	333
Directing respiratory tract tomography.	20
Reading and interpreting radiographs for bone-age study.	449

TASKS LISTED BY TYPE OF MAIN RECIPIENT, RESPONDENT OR CO-WORKER (continued)

Category and Abbreviated Task Name	Task Code No.
MISCELLANEOUS (continued)	
Selecting gastrointestinal and biliary tract radiographic materials for use in case conference or lecture presentations or for inclusion in library.	310
Selecting and assembling radiographs and related case history information for use in case conference in diagnostic radiology.	391
Reviewing and selecting current and/or inactive radiographs for instructional use.	393
Deciding on whether to enter suggested radiographs of gastrointestinal and biliary tracts into log book based on quality and educational value.	351
Deciding on diagnostic radiology library acquisitions of books, journals and radiographic materials; coding library acquisitions.	322
Conducting literature review for clinical research problem in diagnostic radiology.	67
Formulating a problem for clinical research in diagnostic radiology.	66
Preparing research design in clinical diagnostic radiology; supervising research; analyzing, evaluating results; and preparing report.	68

CHAPTER 3

TASK DESCRIPTIONS:

DIAGNOSTIC RADIOLOGY MEDICAL TASKS

There are 143 tasks included in this chapter. These are arranged numerically by Task Code Number from Code 1 to Code 489. Not all numbers are represented in this volume.

There is no chapter pagination. Instead, the pages within each task are numbered. The user can find the task by referring to the Task Code Number and task page number at the upper right of each page.

Some tasks have a notation at the bottom of the first sheet which states, "This is a new assignment to this number." This indicates that an earlier use was made of the number, and the earlier assignment is now obsolete. All other code numbers up to Code 273 in this volume are tasks that were also found by HSMS in an ambulatory care center where a pilot test of the HSMS method was carried out.

TASK DESCRIPTION SHEET

Task Code No. 1

This is page 1 of 4 for this task.

1. What is the output of this task? (Be sure this is broad enough to be repeatable.)

Decision made on whether to go ahead with barium enema; administration of barium enema (and air contrast) supervised; large intestines observed on fluoroscope monitor and spot films taken; radiographs and air contrast ordered; complete set of radiographs approved; medical impressions and follow up care recorded; MD notified of emergency signs.

2. What is used in performing this task? (Note if only certain items must be used. If there is choice, include everything or the kinds of things chosen among.)

X-ray requisition form and patient's chart; scout film; view boxes; prepared barium enema; fluoroscope, TV monitor, spot film device with cassettes or roll film; pen; telephone; cancellation forms; protective lead garments; balloon catheters or other air insufflator, syringe, tube, clamp, enema nozzles

3. Is there a recipient, respondent or co-worker involved in the task? Yes...(X) No...( )

4. If "Yes" to q. 3: Name the kind of recipient, respondent or co-worker involved, with descriptions to indicate the relevant condition; include the kind with whom the performer is not allowed to deal if relevant to knowledge requirements or legal restrictions.

Any non-pediatric patient to have barium enema radiography; radiologic technologist; referring MD; radiologist; nursing personnel

5. Name the task so that the answers to questions 1-4 are reflected. Underline essential words.

Conducting a radiographic barium enema study of lower gastrointestinal tract of any non-pediatric patient by deciding whether to go ahead based on patient's condition and scout film; reassuring patient; supervising or conducting administration of barium enema; viewing on fluoroscope monitor and taking spot films as decided; ordering radiographs, air contrast study; supervising or conducting air contrast enema; taking spot films and ordering radiographs; deciding when examination is completed by viewing radiographs; recording medical impressions, follow up care; notifying MD of emergency signs.

List Elements Fully

Performer receives the x-ray requisition form and medical information for a patient scheduled for examination of the lower gastrointestinal tract (especially colon) using barium sulfate as the contrast medium (barium enema).

1. Performer reads the patient's requisition form and relevant information to become familiar with the case or to review materials seen earlier.

   Notes any medically relevant history, requests from referring physician, recommendations on technique. Notes whether patient should have followed procedures prior to the examination. Notes whether patient has an infectious or communicable condition, whether female patient is pregnant. May call referring physician to discuss or to obtain additional information.

2. Performer greets patient in examination room. Attempts to reassure patient and explains what will be done. Answers patient's questions. Performer may question patient about symptoms in relation to the condition being studied. May collect additional medical history; checks whether female patient may be pregnant.

   Performer questions patient about the preparatory regimen prescribed to see if it was

OK-RP ; RR; RR

6. Check here if this is a master sheet..(X)

TASK DESCRIPTION SHEET (continued)

Task Code No. 1

This is page 2 of 4 for this task.

List Elements Fully

followed (e.g. taking enema). If performer finds that the regimen has not been followed or that there are contraindications for the patient's well being or the efficacy of the study, performer may cancel the examination.

If the performer decides to cancel, records reasons and any recommendations on cancellation form or has co-worker do this; arranges for rescheduling if appropriate.

Performer may delay cancellation until scout film is viewed. Checks that patient and anyone in examination room is properly shielded.

3. Performer orders scout film and views when ready or views scout film already prepared by technologist:

   a. Performer inspects scout film to see whether contents of colon are sufficiently clear of feces to proceed, and whether technical quality of film is acceptable.
   b. If the performer decides that the patient's colon is not adequately clear, has patient scheduled for another appointment and cancels as described above. If out-patient, may speak to patient to reinforce instructions about what to do at home in preparation for next appointment. May check to see that patient understands; answers questions.
   c. If the technical quality of the scout film is not acceptable, performer indicates the needed adjustments to technologist in position or technique.
   d. If decision is to proceed, asks radiologic technologist or nurse to ready patient and position for barium enema.

4. If performer decides to proceed, dons protective lead garments and positions fluoroscope unit in front of patient.

List Elements Fully

If the fluoroscope attachment for spot films uses cassettes, performer has cassette inserted. Chooses full or appropriate format and sets as appropriate. (If roll film attachment, checks that film is loaded.)

Checks that barium enema has been prepared and hung at proper height near patient; checks that patient has been properly positioned on side, with legs bent and knees up towards chin.

5. Performer talks to patient about what is to be done and why. Attempts to alleviate patient's fears and develop confidence. Answers patient's questions. Makes sure patient understands that he or she is to retain enema during procedure.

6. Performer decides whether to have a simple enema tip used or a special balloon catheter (to facilitate retention). Indicates to subordinate which is to be used.

   a. If balloon catheter is to be used, performer inserts into patient's rectum or has this done. Inflates by using empty syringe to inject air. Watches on TV monitor to be sure that position of catheter is correct and that degree of distension is optimal. Attaches catheter to enema or has this done.
   b. If enema tip is to be used, performer indicates to subordinate when to insert the enema tip into the patient's rectum and reposition patient in supine position.

7. Performer may have lights in room dimmed; positions fluoroscope unit, adjusting position by viewing on TV monitor.

TASK DESCRIPTION SHEET (continued)

Task Code No. 1

This is page 3 of 4 for this task.

List Elements Fully

List Elements Fully

8. Performer indicates to technologist when to start the flow of the contrast solution by opening the enema clamp.

   Performer watches the flow of the solution through the large intestines by activating the fluoroscope and watching on the TV monitor.

   Performer indicates throughout procedure when to reclamp enema, when to let it flow and when to reclamp.

9. Performer observes the flow of the barium solution through the rectum, sigmoid, descending, transverse and ascending colon, cecum and terminal ileum, concentrating on areas of suspected pathology. Performer observes structures and movement. May reassure patient and encourage to retain enema. Watches to be sure that pressure of enema is not excessive. May make notes while observing.

   While observing, performer decides what to record by taking spot films. Instructs patient when to remain motionless for spot film exposures and when to resume normal breathing and relax. As decided, performer activates spot film attachment and foot pedal for radiography. If cassette attachment, may have technologist remove cassette as spots are snapped and insert additional cassettes, or does so personally.

   Performer notes patient's reactions; may decide to provide emergency care. If the patient is unable to retain the enema, or is not tolerating the procedure, performer may decide to cancel. If so, cancels as described above, noting any relevant observations on appropriate form.

10. Performer determines when the fluoroscopic portion of the examination is over and turns off the fluoroscope. Reminds patient to retain enema and asks patient how he or she is feeling.

    a. Performer decides, based on observations during fluoroscopy and requisition sheet, when to have radiologic technologist take standard series of overhead radiographs and whether to order additional exposures and/or positions, with or without barium retained. Indicates orders to technologist. May record.
    b. If any radiographs have been ordered with barium enema retained, performer examines these on view boxes as soon as they are processed and determines whether any others are needed. May ask for change in technical factors.
    c. When no more radiographs are required with barium enema retained, performer orders post-evacuation radiographs.
    d. Performer may record preliminary medical impressions at once on requisition sheet or delay until radiographs are processed.

11. Performer looks at the processed spot films and radiographs on view boxes as soon as they are ready:

    a. Determines whether the radiographs are technically adequate to demonstrate the area and condition under study and provide sufficient information to make possible a competent medical interpretation. Performer may ask opinion of clinician or another radiologist.
    b. Performer decides whether to order air contrast films and further fluoroscopy, considering the information already available on the radiographs, the way in which the patient responded to the procedure,

TASK DESCRIPTION SHEET (continued)

Task Code No. 1

This is page 4 of 4 for this task.

List Elements Fully

the patient's condition, and his or her cumulative exposure.

12. If performer orders air contrast, performer supervises the introduction of the air medium into the large intestines using fluoroscopy:
    a. Reassures patient and explains what will happen.
    b. Supervises while nurse or technologist prepares (fills) large bore Foley catheter with air syringe or prepares other air insufflator, attaches rectal tip and clamp, and inserts tip into patient's rectum.
    c. Performer positions patient and overhead fluoroscope unit and observes on TV monitor while administering the air. Performer adjusts the clamp and the rate of flow of air to inject the proper amount of air needed without excessive pressure. Performer checks for appropriate distension.
    d. Performer turns patient from side to side or has this done during filling to facilitate visualization. Views areas of interest on TV monitor, such as sigmoid colon, splenic flexure, and hepatic flexure.
    e. Performer views the suspicious areas noted during earlier fluoroscopy and on radiographs, as described above. Performer takes spot films as deemed appropriate, as described above.

13. Performer decides when enough spot films with the air contrast medium have been taken and turns off the fluoroscope.

    Performer decides on the radiographs to order with air contrast medium retained. May record orders. Performer encourages the patient to retain the air.

List Elements Fully

14. Performer reviews the processed air contrast films as described above, ordering any additional ones as needed.

15. When performer has determined that the examination has been completed, indicates this and has enema tube removed. Performer may have patient cleansed and/or room and equipment cleaned with antiseptic solution; may have other clean up procedures followed to avoid infection or contamination.

16. If performer judges that any emergency signs are in evidence, performer notifies patient's physician. Notifies physician of preliminary findings if so requested.

17. Performer may record impressions of procedure on patient's chart:
    a. Preliminary findings.
    b. How patient tolerated procedure.
    c. Any special nursing follow-up recommended.
    d. May sign chart or requisition sheet.

TASK DESCRIPTION SHEET

Task Code No. 2

This is page 1 of 4 for this task.

1. What is the output of this task? (Be sure this is broad enough to be repeatable.)

Decision made on whether to go ahead on barium swallow study of esophagus; pt. reassured; barium mixture administered; esophagus and stomach observed with fluoroscopy and spot films and/or cine films taken in appropriate positions and with barium pill if so decided; radiographs ordered; complete set of radiographs approved;decision made on delayed films; medical impressions and follow-up care recorded;delayed films ordered; MD notified of emergency signs.

2. What is used in performing this task? (Note if only certain items must be used. If there is choice, include everything or the kinds of things chosen among.)

X-ray requisition form and patient's chart; scout film; view boxes; prepared barium colloidal suspension; barium pill; cup; straw; fluoroscope, TV monitor, spot film device with cassettes or roll film; pen; telephone; cancellation forms; protective lead garments; shielding; cineradiography camera

3. Is there a recipient, respondent or co-worker involved in the task? Yes...(X) No...( )

4. If "Yes" to q. 3: Name the kind of recipient, respondent or co-worker involved, with descriptions to indicate the relevant condition; include the kind with whom the performer is not allowed to deal if relevant to knowledge requirements or legal restrictions.

Any non-pediatric patient to have barium swallow radiography; radiologic technologist;referring MD; radiologist

5. Name the task so that the answers to questions 1-4 are reflected. Underline essential words.

Conducting a radiographic barium swallow study of esophagus of any non-pediatric patient by deciding whether to go ahead based on patient's condition and scout film; reassuring patient; supervising oral administration of barium mixture; viewing on TV monitor, and taking spot films and cine in appropriate positions as decided and with barium pill swallowed if so decided; ordering radiographs; deciding when examination is completed by viewing radiographs;deciding whether to order delayed films; recording medical impressions, follow up care and/or delayed films; notifying MD of emergency signs.

List Elements Fully

Performer receives the x-ray requisition form and medical information for a patient scheduled for a study of the esophagus using a barium sulfate colloidal suspension as the contrast medium (barium swallow).

1. Performer reads the patient's requisition form and relevant information to become familiar with the case if study was routinely ordered, or to review materials seen earlier.

   Notes any medically relevant history, requests from referring physician, recommendations on technique. Notes whether patient has infectious or communicable condition, whether female patient may be pregnant. May call referring physician to discuss or to obtain additional information.

2. Performer greets patient in examination room. Attempts to reassure patient and explains what will be done. Answers patient's questions. Performer may question patient about symptoms in relation to the condition being studied. May collect additional medical history; checks whether female patient may be pregnant.

3. If not already prepared, performer orders scout film. Checks that patient and anyone in examination room is properly shielded. Views processed scout film prepared by technologist on view box:

OK-RP;RR;RR

6. Check here if this is a master sheet..(X)

This is new assignment to this number.

TASK DESCRIPTION SHEET (continued)

Task Code No. 2

This is page 2 of 4 for this task.

List Elements Fully

a. Performer decides whether the technical quality of the radiograph adequately demonstrates the area to be studied for purposes of interpretation; if not, performer indicates the needed technical adjustments or changes in position to technologist or records on requisition form, as appropriate.
b. Performer inspects scout film to see whether there is evidence of barium remaining from any earlier study, thus interfering with current examination. If this is the case, cancels examination; records reasons and any recommendations on cancellation form or has appropriate co-worker arrange for cancellation; has patient rescheduled if appropriate.

4. If performer decides to proceed, performer dons protective lead garments; makes sure that patient is properly shielded. If spot film attachment uses cassettes, performer has cassette inserted. Chooses full, half or quarter format and sets as appropriate. (If roll film attachment, checks that attachment is loaded with film or has this done.) Has technical factors set for fluoroscopy. If available, checks that 16mm. cineradiography equipment is ready.

5. Performer has patient appropriately positioned for the examination in front of vertical table.

    a. If patient is unable to maintain an erect position, performer notes this on requisition form and proceeds with patient in alternative position.
    b. Places fluoroscopic unit in front of patient.
    c. Performer has patient or technologist hold cup containing barium sulfate mixture and await orders from performer.

List Elements Fully

    d. When ready for fluoroscopy, performer may have lights in room dimmed; turns on fluoroscope or has this done. Adjusts unit for viewing on TV monitor.

6. For erect position, performer indicates to technologist (or patient if patient is holding barium mixture) when patient is to sip mixture, hold in mouth, when to swallow, what positions to assume, and when to hold steady, and hold breath. Performer may assist patient on table or unit or may have technologist assist.

    a. If the patient is totally unable to swallow or is not tolerating the procedure, performer may decide to cancel. If so, cancels as described above, noting any relevant observations on appropriate form.
    b. If the patient is able to swallow, performer observes the flow of the barium through the patient's esophagus, esophago-gastric junction and stomach on the TV monitor. Performer notes the ease or difficulty with which the patient swallows. Performer instructs patient in frequency and size of swallows. Performer continues having patient swallow on orders while observing the structures and movement until the performer has sufficient information on the condition.
    c. While observing on TV monitor, performer decides what to record as spot films or on cine. As decided, performer activates cine camera and spot film attachment and x-ray button. If cassette attachment, may have technologist remove cassette as spots are snapped and insert additional cassettes, or performer does so personally.

TASK DESCRIPTION SHEET (continued)

Task Code No. 2

This is page 3 of 4 for this task.

List Elements Fully

7. If patient has history of difficulties with swallowing, or if patient is currently complaining of pain or difficulty in swallowing, performer may decide to use barium pill.

   a. Performer has technologist prepare barium pill and explains to patient what is to happen.
   b. When patient is properly positioned, performer indicates to patient or technologist when to have patient swallow pill, using barium mixture to wash it down.
   c. Performer watches on TV monitor while patient swallows the pill. Performer observes the swallowing action, the ease with which this is accomplished and the course of the pill, noting any interference or blockage.
   d. Performer takes spot films when deemed appropriate, as described above, or uses cine camera.
   e. Performer may compare the known size of the pill with any observed obstructions to estimate size of obstacles or growths. May make notes on requisition sheet.

8. Performer may decide to examine patient in prone-oblique and/or supine-oblique positions due to inability of patient to sit or stand in erect positions or to provide additional information.

   a. Performer has patient positioned as appropriate on horizontal table. May assist. May adjust table and/or fluoroscope unit.
   b. If patient has not been able to sit or stand in erect position, performer may assist patient to drink barium mixture or have technologist do this by supporting patient and providing a straw through which to sip the mixture.

List Elements Fully

   c. Performer observes the flow of the barium solution through the esophagus, esophago-gastric junction, and stomach. Takes spot and/or cine films and repeats other procedures as described above, with patient in appropriate position(s).

9. Performer determines when the fluoroscopic portion of the examination is over and turns off the fluoroscope and/or cine camera.

   a. Performer decides, based on observations during fluoroscopy and requisition sheet, whether to have radiologic technologist take only standard series of overhead radiographs or whether to order additional exposures and/or positions, with or without the patient swallowing additional barium. Explains what is needed to technologist and/or enters on requisition sheet.
   b. Performer may record preliminary medical impressions at once on requisition sheet or delay until the radiographs are processed.

10. Performer looks at the processed spot films and radiographs on view boxes as soon as they are ready:

   a. Determines whether the radiographs are technically adequate to demonstrate the area and condition under study and provide sufficient information to make possible a competent medical interpretation. Performer may ask opinion of clinician or another radiologist.
   b. Performer decides whether to order additional views or a change in the technical factors and a repeat of portions of the radiographic examination, and/or whether to order delayed radiographs. Considers the

TASK DESCRIPTION SHEET (continued)

Task Code No. 2

This is page 4 of 4 for this task.

List Elements Fully	List Elements Fully

information already available on the radiographs, the way in which the patient responded to the procedure, the patient's condition, and his or her cumulative exposure.

11. If the performer decides to order additional views, a repeat with changes in the technical factors, or delayed radiographs, informs technologist what is needed, including use of additional barium solution; may record. Performer examines additional radiographs as described above (except for delayed films).

    When performer has determined that the examination has been completed, informs technologist that he or she can terminate the procedure and have the patient sent home, back to room, or to next procedure. If appropriate, has decontamination and/or sanitary clean up procedures carried out.

12. If performer judges that any emergency signs are in evidence, performer notifies patient's physician at once.

13. Performer may record impressions of procedure on patient's chart:

    a. Preliminary findings.
    b. How patient tolerated procedure.
    c. Any special nursing follow-up recommended or delayed films ordered.
    d. May sign chart or requisition sheet.

TASK DESCRIPTION SHEET

Task Code No. 3

This is page 1 of 4 for this task.

1. **What is the output of this task?** (Be sure this is broad enough to be repeatable.)

Decision made on whether to go ahead with barium study of upper GI tract; pt. reassured;barium mixture administered;upper GI tract observed with fluoroscopy;spot films,cine films taken with pt. erect, prone, supine, with pressure cone attachment, and with barium pill if so decided; radiographs ordered; complete set of radiographs approved; decision made and recorded on delayed films and/or air contrast study of stomach; medical impressions and follow-up care recorded; MD notified of emergency signs.

2. **What is used in performing this task?** (Note if only certain items must be used. If there is choice, include everything or the kinds of things chosen among.)

X-ray requisition form,patient's chart;scout film; view boxes;prepared barium colloidal suspension;barium pill;cup;straw;cone attachment;cine camera;fluoroscope, TV monitor, spot film device with cassettes or roll film; pen; telephone; cancellation forms; protective lead garments; shielding

3. Is there a recipient, respondent or co-worker involved in the task? Yes...(X) No...( )

4. **If "Yes" to q. 3:** Name the kind of recipient, respondent or co-worker involved, with descriptions to indicate the relevant condition; include the kind with whom the performer is not allowed to deal if relevant to knowledge requirements or legal restrictions.

Any non-pediatric patient to have upper GI barium study radiography; radiologic technologist;referring MD; radiologist

5. **Name the task** so that the answers to questions 1-4 are reflected. Underline essential words.

Conducting a radiographic barium study of upper gastrointestinal tract of any non-pediatric patient by deciding whether to go ahead based on pt.'s condition and scout film;reassuring pt.;supervising oral administration of barium mixture;viewing on TV monitor; taking spot films and cine with pt. in erect,prone, supine positions, with pressure applied by cone attachment, with barium pill swallowed if so decided; ordering radiographs;deciding when examination is completed by viewing radiographs;deciding whether to order delayed films and/or air contrast study of stomach;recording medical impressions;follow up care and/or delayed films and/or air contrast study;notifying MD of emergency signs.

List Elements Fully

Performer receives the x-ray requisition form and medical information for a patient scheduled for a study of the upper gastrointestinal tract (esophagus, stomach, and small intestine) using a barium sulfate colloidal suspension as the contrast medium.

1. Performer reads the patient's requisition form and relevant information to become familiar with the case if study was routinely ordered, or to review materials seen earlier.

   Notes any medically relevant history, requests from referring physician, recommendations on technique. Notes whether patient should have followed preparatory procedures prior to the examination, and whether patient has an infectious or communicable condition, whether female patient may be pregnant.May call referring physician to discuss or to obtain needed information.

2. Performer greets patient in examination room. Attempts to reassure patient and explains what will be done. Answers patient's questions. Performer may question patient about symptoms in relation to the condition being studied. May collect additional medical history; asks female patient if she thinks that she is pregnant.

OK-RP;RR;RR

6. Check here if this is a master sheet..(X)

TASK DESCRIPTION SHEET (continued)

Task Code No. 3

This is page 2 of 4 for this task.

List Elements Fully

Performer questions patient about the preparatory regimen prescribed to see if it was followed (e.g. not having breakfast). If performer finds that the regimen has not been followed and will interfere with the study, performer cancels examination, records reasons and any recommendations on cancellation form or has appropriate co-worker arrange for cancellation; has patient rescheduled if appropriate.

3. If performer decides to proceed, checks for proper shielding and orders scout film. Views when ready or views scout film already prepared by technologist:

   a. Performer decides whether the technical quality of the radiograph adequately demonstrates the organs to be studied for purposes of interpretation; if not, performer indicates the needed technical adjustments or changes in position to technologist, or records on requisition form.
   b. Performer inspects scout film to see whether there is evidence of barium remaining from any earlier study, thus interfering with current examination. If so, performer cancels; orders rescheduling as described.

4. If performer decides to proceed, dons protective lead garments. Makes sure patient and anyone to remain in room is properly shielded. If spot film attachment uses cassettes, performer has cassette inserted. Chooses full, half or quarter format and sets as appropriate. (If roll film attachment, checks that attachment is loaded with film or has this done.) Has technical factors set for fluoroscopy. If available, checks that 16mm. cineradiography equipment is ready and technical factors set.

5. Performer has the patient positioned for the portion of the examination done with the patient erect:

List Elements Fully

   a. If patient is unable to maintain an erect position, performer notes this on requisition form and proceeds to the portion of the examination done with the patient in prone position.
   b. Performer places fluoroscope unit in front of patient. Has patient or technologist hold cup containing barium sulfate mixture and await orders from performer.
   c. When ready for fluoroscopy, performer may have lights in room dimmed; turns on fluoroscope or has this done. Adjusts unit for viewing on TV monitor.

6. For erect portion of examination, performer indicates to technologist (or patient if patient is holding barium mixture) when patient is to sip mixture, hold in mouth, when to swallow, what positions to assume, when to hold steady, and when to hold breath.

   Performer may assist patient on table or unit or may have technologist assist.

   a. If the patient is totally unable to swallow or is not tolerating the procedure, performer may decide to cancel. If so, cancels as described above, noting any relevant observations on appropriate form.
   b. If the patient is able to swallow, performer observes the flow of the barium through the patient's esophagus, esophago-gastric junction, stomach, and duodenum on the TV monitor. Performer instructs patient in frequency and size of swallows. Performer continues, observing the structures and movement with swallows repeated until the performer has sufficient information.
   c. While observing on TV monitor, performer decides what to record as spot films and/or on cine film.

TASK DESCRIPTION SHEET (continued)

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This is page 3 of 4 for this task.

List Elements Fully

Performer activates spot film attachment and x-ray button. If cassette attachment, may have technologist remove cassette as spots are snapped and insert additional cassettes, or performer does so personally. Activates cine camera when decided.

7. Performer prepares for pressure spot films of the gastric mucosa and the duodenal bulb with the patient erect:

   a. Performer has pressure cone attachment moved into place. Performer positions cone so that there is pressure exerted on the area of interest.
   b. Performer observes on the TV monitor. Has patient drink additional barium mixture as required for visualization.
   c. Performer observes response to pressure, pliability and rigidity of the area.
   d. Performer decides what to record as spot films, and activates spot film attachment when decided as described above.
   e. Performer repeats procedure for areas of the stomach as decided and for spot films of duodenal bulb. Performer has patient drink additional barium mixture as needed.
   f. Performer removes pressure cone when all the required pressure spot films are taken.

8. Performer has the patient positioned for the portion of the examination done with the patient lying on horizontal examination table.

   a. Performer has patient positioned in prone-oblique position. May assist and/or reassure patient. May adjust table or fluoroscope unit.
   b. Performer has patient sip barium mixture as appropriate. If patient has not been able to sit or stand for erect positions, performer may assist patient to drink barium mixture or have technologist do this by supporting patient and providing a straw through which to sip the mixture.
   c. Performer observes the flow of the barium mixture through the esophagus, esophago-gastric junction, stomach and duodenum. Takes spot films and/or cine films; repeats other procedures as described above, with patient in prone-oblique position.
   d. Performer repeats appropriate steps as described above after positioning patient in supine-oblique position.

9. If patient has history of difficulties with swallowing or if patient is currently complaining of pain or difficulty in swallowing, performer may decide to use barium pill for final portion of examination with patient erect or on table tilted to erect position:

   a. Performer has technologist prepare barium pill and explains to patient what is to happen.
   b. When patient is properly positioned, performer indicates to patient or technologist when to have patient swallow pill, using sip of barium mixture to wash it down.
   c. Performer watches on TV monitor while patient swallows the pill. Performer observes the swallowing action, the ease with which this is accomplished, and the course of the pill, noting any interference or blockage.
   d. Performer takes spot films when deemed appropriate and/or cine film as described above.
   e. Performer may compare the known size of the pill with any observed

TASK DESCRIPTION SHEET (continued)

Task Code No. 3

This is page 4 of 4 for this task.

List Elements Fully

obstructions to estimate size of obstacles or growths. May make notes on requisition sheet.

10. Performer determines when the fluoroscopic portion of the examination is over and turns off the fluoroscope.

    a. Performer decides, based on observations during fluoroscopy and requisition sheet, whether to have radiologic technologist take only standard series of overhead radiographs or whether to order additional exposures and/or positions, with or without the patient swallowing additional barium. Explains what is needed to technologist and/or enters on requisition sheet.
    b. Performer may record preliminary medical impressions at once on requisition sheet or delay until the radiographs are processed.

11. Performer looks at the processed spot films and radiographs on view boxes as soon as they are ready:

    a. Determines whether the radiographs are technically adequate to demonstrate the area and condition under study and provide sufficient information to make possible a competent medical interpretation. Performer may ask opinion of clinician or another radiologist.
    b. Performer decides whether to order additional views or a change in the technical factors and a repeat of portions of the radiographic examination, and/or whether to order delayed radiographs.
    c. Performer notes whether the problem area could involve the top or the distal stomach (areas blocked from view by the rib cage). If so, performer decides to order air contrast study to distend the stomach.

List Elements Fully

        i) Performer decides whether to have air contrast of stomach scheduled for a later time or done immediately.
        ii) Performer fills out requisition sheet for air contrast study for scheduling as appropriate, or arranges to proceed immediately with air contrast study.
    d. In deciding to order additional views or studies performer considers the information already available on the radiographs, the way in which the patient responded to the procedure, the patient's condition, and his or her cumulative exposure.

12. If the performer decides to repeat any of the radiography with changes in the technical factors, to order additional views or delayed radiographs, informs technologist what is needed, including use of additional barium solution; may record. Performer examines additional radiographs as described above (except for delayed films).

When performer has determined that the current examination has been completed, informs technologist that he or she can terminate the procedure and have the patient sent home, back to room, or to next procedure. If appropriate, orders decontamination and/or sanitary clean up procedures.

13. If performer judges that any emergency signs are in evidence, performer notifies patient's physician at once.

14. Performer may record impressions of procedure on patient's chart:

    a. Preliminary findings.
    b. How patient tolerated procedure.
    c. Any special nursing follow-up recommended, delayed films or air contrast of stomach ordered.
    d. May sign chart, requisition sheet.

TASK DESCRIPTION SHEET

Task Code No. 4

This is page 1 of 12 for this task.

1. **What is the output of this task?** (Be sure this is broad enough to be repeatable.)

Pt.reassured;pelvic exam performed;decisions made on going ahead,route of inducing pneumoperitoneum,puncture site,technique;Foley catheter inserted in uterus;local anesthetic injected;peritoneum punctured via vaginal posterior fornix or abdomen;tubing inserted or attached;pneumoperitoneum induced;pneumograms ordered and reviewed;contrast instilled into uterus and tubes via Foley catheter as decided,under fluoroscopic control;pangynecograms ordered and approved;medical impressions and orders for later study,delayed films,nursing care recorded;MD notified of emergency.

2. **What is used in performing this task?** (Note if only certain items must be used. If there is choice, include everything or the kinds of things chosen among.)

Pt.'s x-ray requisition form,medical chart,radiographs,ultrasonograms;pen;phone;view boxes;sterile tray with lubricant,speculum,sound,antiseptic,anesthetic,saline solutions,swabs,Foley catheter,uterine packing and tenaculum forceps,clamp,plug,dilator,water,syringes,aqueous contrast solution,drape,hemostat,puncture needles,vinyl and extension tubing,dressings;CO2 or N2O tank;insufflation equipment,stopcock;x-ray table;fluoroscope unit,TV monitor,videotape attachment;tape;sterile gown,gloves;protective lead garments; emergency cart

3. Is there a recipient, respondent or co-worker involved in the task? Yes...(X) No...( )

4. **If "Yes" to q. 3:** Name the kind of recipient, respondent or co-worker involved, with descriptions to indicate the relevant condition; include the kind with whom the performer is not allowed to deal if relevant to knowledge requirements or legal restrictions.

Non-infant female pt.;accompanying adult;radiologic technologist;referring MD;radiologist;gynecologist; nurse

5. **Name the task** so that the answers to questions 1-4 are reflected. Underline essential words.

Conducting pelvic pneumography and/or pangynecography of non-infant female pt.by reviewing,doing pelvic exam;deciding whether to go ahead and on route,site, technique;reassuring;inserting Foley catheter in uterus;injecting local anesthetic;puncturing posterior vaginal fornix or abdomen;inserting or attaching tubing;inducing pneumoperitoneum transuterinely,transvaginally or transabdominally;ordering pneumograms and viewing;instilling contrast medium through Foley catheter into uterus and tubes as decided;observing and filming filling under fluoroscopic control;ordering,approving pangynecograms;removing gas,instruments; recording medical impressions,orders for follow-up, delayed films;notifying MD of emergency signs.

List Elements Fully

Performer receives the x-ray requisition form and medical information on a female patient scheduled for pelvic pneumography (radiography of the uterus, oviducts and ovaries after instillation of gas into the peritoneal cavity) or pangynecography (pelvic pneumography followed at once by instillation of positive contrast material into uterus and fallopian tubes, creating simultaneous visualization of uterine cavity, ovaries, tubes and uterus; also called complete gynecography). Requisition may be for initial examination or may follow a prior radiographic study.

1. Performer reads the patient's medical history and requisition form to review the case or to become familiar with materials seen earlier in consultation in order to make decisions about the conduct of the radiographic study and check on the request of the referring clinician:
   a. Performer notes the nature of the request, whether for pelvic pneumography or pangynecography, and the recommended route to induce the pneumoperitoneum. Notes the patient's age, size, and the reason for the examination, such as uterine or adnexal masses, need to evaluate ligated tube, problems of infertility, suspected occlusion of the tubes, vagina or cervix, difficulty in obtaining

OK-RP;RR;RR

6. Check here if this is a master sheet..(X)

This is new assignment to this number.

TASK DESCRIPTION SHEET (continued)

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accurate information from bimanual examination. Notes the medical history and location of suspected pathology.

b. Performer notes any relevant test results; reads reports on any prior radiographic studies or plain films; examines radiographs on view boxes to become familiar with the area under study and the diagnostic information available. Reviews any ultrasonograms available.

c. Performer reviews medical history and clinical information to determine whether any current medical condition is a contraindication to the study, such as acute or subacute pelvic inflammatory disease, peritonitis, uterine bleeding, suspected or verified pregnancy, cardiac or respiratory disease, presence of large mass filling entire pelvic cavity; additional contraindications for transuterine route, such as questionable adnexal disease; contraindications for transvaginal route, such as tumors in posterior fornix, previous hysterectomy; and other indications for transabdominal route, such as vaginitis, cervicitis, vaginal anomalies. Performer checks record of patient's menstrual cycle and makes sure that patient is in appropriate stage of cycle, such as 8th or 9th day, especially if pangynecography is to be performed. Makes sure that clinician has ruled out current pregnancy.

d. Performer notes whether there is a history of adverse reactions to contrast medium or prior radiographic procedures; notes whether patient has an infectious or communicable condition. May call referring physician to obtain additional information.

e. Notes any recommendations on technique. Checks whether any orders have been given for pre-examination procedures to be done by patient at home or in hospital, such as cleansing enema, no breakfast or light breakfast, and if carried out; if not, arranges to have this done. Performer notes any recommendations or order for prior administration of tranquilizer, analgesic and/or smooth muscle relaxant. If not already done orders and allows for appropriate timing.

f. Checks to see that patient has signed consent for procedure. If not, informs appropriate co-worker and either has examination delayed until written consent is obtained or arranges to obtain personally.

2. Performer greets patient and any accompanying adult in examination room. Attempts to reassure; explains what will be done so as to gain patient's cooperation. Depending on performer's assessment of the patient's state and the needs of the situation, performer may cover any or all of the following:

a. May question patient about symptoms in relation to the condition being studied. May collect additional medical history and ask about previous radiography, allergies. May question patient to determine any possible pregnancy.

b. Performer may explain that patient will be asked to hold still from time to time. May indicate what will happen, what pain might be experienced, and what cooperation will be needed. Stresses need to maintain positions when ordered. Answers questions. May demonstrate.

c. If out-patient, performer may check whether there will be someone present to escort patient home after procedure is terminated.

TASK DESCRIPTION SHEET (continued)

Task Code No. 4

This is page 3 of 12 for this task.

List Elements Fully

d. If appropriate, performer may describe the procedure and its risks and obtain consent signature from patient. (Does not proceed without signed consent.)

e. Unless there are obvious contraindications to going ahead, performer has patient void to empty bladder or, if necessary, may have patient catheterized to empty bladder.

f. Performer may order scout film of pelvis with patient in prone, head-down position with table at 45° such as for pangynecography or wait until after pelvic examination.

3. Performer may decide to perform a pelvic examination or may arrange to have this done by gynecologist. Has patient prepared in dorsal lithotomy position. If performer does pelvic examination personally, proceeds as follows:

   a. Reassures patient and explains what will be done.
   b. Dons sterile gown and gloves, when appropriate, over protective lead garments.
   c. Performer has patient's vulva, perineum and vagina cleansed with antiseptic solution or does so personally. Has area draped with sterile towels. Makes sure fresh sterile gown and gloves are donned after cleansing.
   d. Performer carries out a bi-manual examination of patient's vagina and notes the size and position of the uterus.
   e. Performer uses water soluble lubricant and inserts a sterile bivalve speculum (usually radiolucent) to expose the cervix. Notes the type of cervical os and the general condition of the cervix, whether there is evidence of laceration and repairs, lesions, etc.
   f. Performer may inspect the patency and size of the uterine cavity and the endocervical canal by sounding:

List Elements Fully

      i) Performer adjusts the speculum to obtain the desired dilation.
      ii) Performer uses a sterile tenaculum forceps to grasp and hold the cervix (anterior or posterior lip depending on its position).
      iii) Inserts a sterile sound, being careful not to touch the sides of the vagina or rupture the uterus. Repeats if appropriate and judges the extent of any obstruction which might interfere with the procedure. Removes sound.
      iv) If obstruction is found, performer determines whether it is total, thus making it impossible to continue, whether it is partial and may be overcome by attaching a narrow dilator to a Foley catheter (during the procedure), or whether any partial obstruction requires that the patient be dilated by a gynecologist.
      v) Depending on evaluation and the circumstances, performer decides whether to have procedure terminated, delayed for dilation by attending gynecologist, rescheduled, or whether to use a transabdominal approach and continue.
   g. If the pneumoperitoneum is to be induced transabdominally, performer examines abdomen to assess relative obesity and judge appropriate needle length. Notes presence of any scars to be avoided at possible injection site such as from laparotomy.

4. If not already done, performer orders preliminary scout film in pangynecography position. Performer examines scout film on view box:

   a. Notes whether the technical quality of the radiograph is adequate to

TASK DESCRIPTION SHEET (continued)

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This is page 4 of 12 for this task.

List Elements Fully

demonstrate the organs under study. If not, indicates to technologist the needed technical adjustments or change in patient's position, or records on requisition.

b. Performer inspects to see whether there is evidence of contrast medium from earlier study (such as barium), whether the patient's colon is sufficiently clear of feces and gas, and bladder is sufficiently empty for proper visualization of female organs; decides whether patient should be rescheduled.

5. Performer decides whether to go ahead with the procedure based on the patient's clinical records, the prior radiographs, scout film, the information obtained from the patient, and the information obtained personally from the pelvic examination, or from the gynecologist doing the pelvic examination.

   a. Performer considers whether there have been changes in the patient's condition since the decision was made to do the procedure that are contraindications to going ahead. May have specialist or clinician called or discusses problems with gynecologist. Decides whether to proceed or not based on assessment of patient's current condition and any discussion.
   b. If performer decides not to have procedure done, performer records reason for cancellation and any recommendations on chart, requisition, or appropriate form. May indicate need to have proper preliminary procedures carried out. May indicate to out-patient need to have patient revisit referring physician for further care and/or dilation. Informs staff of cancellation and discusses with patient. If appropriate, orders

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rescheduling or scheduling for alternative procedure.

6. If performer decides to proceed, makes final decisions on technique based on requisition sheet, scout film, clinical evidence and own or gynecologist's examination.

   a. Performer may document corroborative finding that no pregnancy is evident.
   b. Performer makes a final decision on whether to induce the pneumoperitoneum transvaginally, transuterinely or transabdominally, based on the patient's condition, the request, and institutional standards. Does not use transvaginal route if pangynecography may be done.
   c. Performer may decide whether to perform only pelvic pneumography or pangynecography. If the latter, may decide whether he or she will be examining the fallopian tubes as well as the uterus, whether to instill medium fractionally.
   d. Performer chooses appropriate materials, instruments and sizes, such as Foley catheter. For transabdominal or transvaginal entry, selects appropriate size and length of needle depending on patient's size and obesity. For hysterosalpingography portion, decides on and orders sufficient aqueous iodine-based contrast solution to suit the needs of the study and the estimated size of the organ(s) to be studied. Performer chooses nitrous oxide or carbon dioxide to induce pneumoperitoneum. Has appropriate local anesthetic prepared in syringe(s).
   e. For transabdominal route performer selects puncture site (such as left upper quadrant below costal margin along lateral rectus border, below umbilicus, above and to left of umbilicus).

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f. Performer may arrange to have patient dilated by attending gynecologist. If so, waits for indication that patient is ready.

g. If appropriate, writes decisions on requisition sheet; informs appropriate co-workers so that materials selected and technical factors can be prepared or set.

7. Performer makes sure that materials are ready for procedure:

a. Performer checks that all materials needed for the procedure are present on sterile tray. Checks that emergency cart is present. Requests any missing objects.

b. For pangynecography performer has a syringe prepared with the contrast medium selected. Checks appearance of contrast medium to be sure there is no chemical deterioration and that there is sufficient contrast for study. Makes sure that all the air in the syringe is replaced with the contrast material.

c. Has insufflator equipment tested. If Foley catheter will be used, has it checked for defects.

d. Has patient returned to modified lithotomy position. If not already done, has perineum and vagina cleansed with antiseptic solution and draped.

e. Has everyone in room given gonadal shielding.

8. If performer has decided to induce the pneumoperitoneum by the transvaginal "cul-de-sac" route, performer proceeds as follows:

a. Performer explains what will be done. If not already done, performer inserts vaginal speculum. Applies antiseptic solution to the cervix and posterior vaginal fornix.

b. If sounding has been done, checks that tenaculum forceps is in place.

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Otherwise inserts sterile tenaculum forceps to grasp and hold posterior lip of the cervix.

c. Performer opens vaginal speculum sufficiently to place posterior vaginal fornix under extreme tension. Applies upward and forward traction to cervix until the uterosacral ligaments are identifiable.

d. Performer checks syringe prepared with anesthetic solution. Attaches to appropriate angiographic hollow needle.

e. Performer inserts needle into uterosacral ligaments and injects anesthetic so as to infiltrate ligaments.

f. Pushes needle between ligaments into abdominal cavity, noting feeling as pouch of Douglass is entered. Injects additional anesthetic when abdominal cavity is reached,and notes ease of injection as a test of satisfactory penetration of cavity.

g. When proper entry has been checked performer secures needle in posterior fornix with a hemostat. Removes syringe.

h. Performer introduces sterile polyethylene tubing into abdominal cavity by inserting through hollow needle. Advances an appropriate distance noting any resistance. If resistance is felt, performer may reinsert needle until abdominal cavity is accurately penetrated and tubing is introduced.

i. Performer removes the needle and speculum leaving tubing in place. Has patient turned to prone position.

j. Performer connects tubing to insufflation apparatus using connecting tubing and blunt tip needle. May use stopcock. Checks system for leaks; flushes with gas. Presets the rate of flow. Connects

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the stopcock or blunt tip needle to the tubing and opens it to the gas line.

k. Performer has patient placed in 15° Trendelenburg position supported by shoulder rests.

l. Performer injects a trial amount of carbon dioxide or nitrous oxide and then continues under controlled pressure. Checks on insufflator that pressure does not exceed 20 mm. of mercury. Adjusts pressure accordingly. Continues injection of gas until appropriate amount has been instilled.

9. If performer has decided to induce pneumoperitoneum by transuterine or transabdominal route, performer proceeds with insertion of a Foley catheter into the uterus to prevent leakage of gas and opaque medium:

   a. Performer explains what will be done.
   b. If not already done, performer inserts a bivalve vaginal speculum and applies antiseptic solution to the vagina and cervix.
   c. If sounding has been done, checks that tenaculum forceps is in place. If sounding has not been done performer inserts sterile tenaculum forceps to grasp and hold the cervix.
   d. If decided earlier, performer prepares to facilitate entry of Foley catheter by inserting a narrow dilator into the orifice of the Foley catheter tip.
   e. Performer inserts the tip of the selected Foley catheter into the vagina and guides it into the uterine cavity with the aid of uterine packing forceps. Inserts into lower segment of uterus or upper portion of cervical canal.

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   f. Performer attaches syringe with sterile water or air to balloon lumen and inflates the catheter balloon (which inflates inside uterus or cervical canal). Performer exerts gentle traction on the catheter to ensure that it will remain above the internal os.
   g. When catheter is being held in place, performer clamps off the lumen and disconnects the syringe. Inserts a self-sealing device in lumen if available or uses clamp.
   h. Performer removes the tenaculum and the speculum leaving the catheter in place.
   i. To lessen discomfort if transuterine route is involved, performer may have syringe prepared with anesthetic solution; attaches to Foley catheter and injects so that anesthetic enters peritoneum via fallopian tubes.

10. If performer has decided to induce the pneumoperitoneum by the transuterine route, performer continues as follows:

   a. Performer connects the Foley catheter to the insufflation apparatus by means of an extension tube. Places patient prone in partial knee-chest position.
   b. Performer injects several cubic centimeters of nitrous oxide or carbon dioxide gas rapidly into the peritoneal cavity through the uterus, checking the amount and the reading on the manometer to test the patency of the fallopian tubes.
   c. Performer makes sure that the pressure does not exceed 180 mm. mercury, and notes reading; judges that at least one tube is patent for readings at 160 mm. of mercury

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or less. For readings of 106 mm. or less, performer judges that the tubes are patent.

d. Performer reassures patient. Indicates that shoulder pain is a normal reaction to the procedure. If the patient reacts with extreme pain, performer may decide that there is evidence of blockage and may suspend the injection.

e. If the performer decides that there is an obstruction in the tubes, performer may decide to use radiography and/or fluoroscopy to determine the nature of the blockage without a further attempt to instill the gas, or performer may decide to induce the pneumoperitoneum transabdominally.

  i) If the performer decides to use fluoroscopy to determine the nature of the blockage, performer positions the overhead fluoroscope unit over patient and positions patient so that the area under study will be shown most effectively on the TV monitor. Performer may have lights in room dimmed. Activates fluoroscope or has this done by technologist. May also activate videotape. Performer adjusts unit until the point of obstruction is visible on the TV monitor. If performer decides to spot film while viewing on TV monitor, selects and sets format. Activates spot film attachment and x-ray foot pedal as appropriate. If cassette attachment, may have technologist remove cassette as spots are snapped and insert additional cassettes, or does so personally. Shuts fluoroscope when observation is completed.

  ii) Based on observations performer attempts to determine the nature of the blockage and whether or not to continue the procedure. If decision is to discontinue, performer records findings and terminates procedure as described below. May order overhead films. If so, specifies views to technologist.

f. If the test for patency is positive at 160 mm. of mercury or less, performer interrupts the injection of the gas. Performer has patient rotated to a 15° Trendelenburg position supported with shoulder rests. Performer checks to see that the catheter has not been disturbed. Continues injection of gas under controlled pressure until appropriate amount has been instilled.

11. If performer has decided to induce the pneumoperitoneum by the transabdominal route, performer continues as follows:

a. Performer has patient placed in supine position.

b. Has the area selected for puncture swabbed with antiseptic solution or does so personally. Covers areas surrounding injection site with sterile towels or drape.

c. Checks amount of local anesthetic to be injected as shown by nurse or draws anesthetic into sterile syringe. Inserts needle intradermally and subcutaneously and injects anesthetic. Removes needle and swabs. Waits for area to become anesthetized.

d. Performer checks puncture needle ordered (Verres, Rochester, or spinal needle).

e. Has patient hold breath and inserts needle into entry site selected. Performer negotiates the needle through the skin, fascia

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and muscle, sensing the needle as it penetrates the abdominal wall until there is a sudden "give" when the needle enters the peritoneal cavity. Performer may direct the needle to an appropriate angle towards the pelvis. May move the needle back and forth to be sure it is not in solid tissue.

f. After the needle has been judged to be into the peritoneal cavity, performer withdraws the inner stylet.

g. Performer checks for safe placement of needle by attaching a sterile syringe, empty or partially filled with saline, to the needle. Performer aspirates and notes whether intestinal or gastric contents or blood are obtained. If so, pulls back or repositions needle until nothing is aspirated. Again checks for free movement of needle. Performer then injects air or saline and notes whether there is a free flow into the peritoneal cavity. Adjusts and/or reinjects until safety test of needle position has assured correct placement.

h. When performer is satisfied that the needle is in the peritoneal cavity, removes syringe. Performer may attach extension tube to protruding end of needle, or withdraws needle leaving a flexible plastic outer cannula in place, depending on needle used.

i. Performer attaches the protruding needle, tube or plastic cannula to the insufflator apparatus using stopcock or other appropriate device. Checks system for leaks; flushes with gas. Presets the rate of flow. Connects the stopcock to the tubing and opens it to the gas line.

j. Performer has patient placed in 15° Trendelenburg position supported by shoulder rests.

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k. Performer injects trial amount of of carbon dioxide or nitrous oxide and then continues under controlled pressure. Checks on insufflator that pressure does not exceed 40 mm. of mercury. Adjusts pressure accordingly. Continues injection of gas until appropriate amount has been instilled.

12. During the instillation of the gas, performer monitors the pressure,rate of flow,and the patient's reactions constantly. Keeps rate of flow low enough to avoid sudden abdominal distension.

a. Checks induction of pneumoperitoneum by percussing contralateral aspect of abdomen and listening for tympanitic note.

b. Checks for absence of flatus from bowels and appearance of symmetrical rounding of the anterior abdominal wall.

c. If patient complains of pain near the site of injection or in left inguinal region, performer ceases the inflation and rechecks the location of the plastic cannula, tubing or needle tip.

d. When performer judges that a satisfactory pneumoperitoneum has been established, performer disconnects insufflator tubing. Clamps Foley catheter (in transuterine approach), inserts obturator or plug into plastic cannula or tubing, or closes spinal needle, (depending on the type of instrument that was left in place). May tape plugged end of cannula or protruding end of needle.

e. Performer may place hands beneath patient's abdomen and gently shake the abdominal contents to allow cephalad displacement of the ab-

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dominal viscera and entry of the gas into the pelvic peritoneal space.

   f. Performer has patient turned to a prone, head down position. Has table tilted to 45° with x-ray tube at a 15° angle caudad. Performer orders frontal and oblique and/or lateral projections as decided.

13. Performer looks at the initial pneumograms on view box as soon as processed:

   a. Determines whether the radiographs are technically adequate to demonstrate the area and condition under study and provide sufficient information to make possible a competent medical interpretation. Performer may ask opinion of another radiologist.
   b. Performer checks for technical quality and notes whether there is any need to adjust technical factors or have the patient's position adjusted.
   c. Performer notes whether the female organs have been properly outlined, whether there is evidence that gas has not been properly instilled, or if there is need to instill additional gas.
   d. If there has been a prior question about tubal obstruction, performer evaluates the evidence indicated on the radiograph(s) at the point of obstruction.
   e. If performer decides to reinject or add additional gas, and/or have additional radiographs taken, performer repeats appropriate steps and evaluates additional radiographs as described. Has patient on table returned to horizontal position when completed.

14. Performer may decide whether it is desirable to continue at once with instillation of opaque contrast medium (hysterosalpingography), whether this should be delayed, is contraindicated, or unnecessary. If so, performer may record decision.

   a. If decision is for delayed hysterosalpingography, may fill out requisition form for later study.
   b. If performer decides to terminate or only pelvic pneumography was ordered, performer returns to patient. For transvaginal route, performer unplugs plastic tube and attempts to express the gas. May use syringe partly filled with saline solution and aspirate gas. Performer then disconnects and gently removes the tubing. Removes tenaculum. Otherwise, performer terminates procedure as described below.
   c. If decision is to continue at once to instill the positive contrast, performer decides whether to visualize the uterus or instill enough of the contrast medium to visualize the uterine tubes and ovaries as well. Indicates orders to staff and explain to patient what is to happen next.

15. Performer decides whether to utilize fluoroscopic control with spot filming and/or videotape for the filling. If spot filming equipment uses cassettes, has cassette inserted. Chooses full, half, or quarter format and sets as appropriate. (If roll film attachment, checks that attachment is loaded with film or has this done.) Has technical factors set for fluoroscopy. May have videotape camera and screen set up and loaded. If not already done, checks materials as described above, including syringe with contrast medium.

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16. Performer continues with hysterosalpingography utilizing the Foley catheter inserted in uterus:

    a. Performer attaches syringe with contrast medium to the catheter. Unclamps catheter. Has patient placed in a head down, Trendelenburg position.
    b. If performer has not decided to use fractional filling or fluoroscopic monitoring to view instillation, performer injects the contrast solution slowly under a controlled, constant low or moderate pressure, using appropriate amount to fill uterus and, if so decided, fallopian tubes.
    c. If performer has decided to utilize fractional filling and fluoroscopic control, performer positions the overhead fluoroscope unit over patient and positions patient or table so that the area under study will be shown most effectively on the TV monitor. Performer may have lights in room dimmed.
        i) Injects a small amount of the contrast solution under a constant low pressure.
        ii) Performer may activate fluoroscope and watch the progress of the solution on the TV monitor.
        iii) If videotape equipment is to be used, performer activates when judged appropriate.
        iv) Performer may decide to make spot films while viewing on TV monitor. Activates spot film attachment and x-ray foot pedal as appropriate. If cassette attachment, may have technologist remove cassette as spots are snapped and insert additional cassettes, or does so personally. Turns off fluoroscope when observation is completed.
        v) If performer decides on overhead radiographs, orders the appropriate projections required for study and has them processed for viewing before continuing.

17. Performer looks at the initial pangynecograms and/or any spot films on view boxes as soon as processed:

    a. Performer checks for technical quality and notes whether there is any need to adjust technical factors or have the patient's position adjusted. If so, indicates what is needed to technologist.
    b. Performer evaluates whether the uterine cavity is being properly filled and outlined.
    c. Performer determines whether there is evidence of blockage, resistance. If so, performer discontinues instillation and attempts to find reason for obstruction. Uses fluoroscopy and/or overhead views to study the area in various appropriate projections.

18. If no initial obstruction is encountered, performer continues incremental filling of the uterus using radiography and/or fluoroscopic control, spot filming and/or videotape.

19. When the performer determines that the instillation of the uterus is completed, performer may decide whether to continue with the filling of the uterine tubes to study any suspected blockage or constriction.

    a. If performer decides not to continue, indicates this to staff and terminates as described below.
    b. If performer decides to continue, performer instills additional contrast material under steady low or moderate pressure. Utilizes fluoroscopy and/or overhead filming as described above.

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c. Performer notes filling of tubes and any spillage into peritoneal cavity while viewing on monitor.

20. Throughout the procedure the performer is alert for obstructions, abnormalities and the extent to which the patient is experiencing pain:

    a. If an abnormality is visualized performer may take spot films or order overhead films in various projections before continuing with instillation.
    b. Performer may interrupt instillation and use instant videotape replay to examine the progress of the filling at any point throughout the procedure as decided.
    c. If patient is experiencing pain, performer asks about the nature of the pain. Notes that cramp-like pain indicates that the contrast material is entering the peritoneal cavity. Reassures patient.
    d. If the patient reacts with extreme pain, performer may decide that there is evidence of blockage and may suspend the injection to investigate.
    e. If the performer decides that there is an obstruction in the tubes, performer suspends the instillation and attempts to determine the nature of the blockage using fluoroscopy and/or overhead filming.
    f. Performer may determine that a tubal spasm is responsible for the tubal occlusion (and pain). If so, performer may apply steady controlled pressure using the syringe with contrast until the spasm is overcome.

21. Performer determines when to terminate the instillation and the fluoroscopic portion of the examination. Orders overhead radiographs, specifying any special views required.

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22. Performer looks at the processed spot films and pangynecograms on view boxes as soon as they are ready:

    a. Determines whether the radiographs are technically adequate to demonstrate the area and condition under study and provide sufficient information to make possible a competent medical interpretation. Performer may ask opinion of another radiologist.
    b. Performer decides whether to order additional views, a change in the technical factors, a repeat of prior portions of the radiographic examination or to instill additional contrast. Considers the information already available on the radiographs, the way in which the patient responded to the procedure, the patient's condition, and her cumulative exposure.
    c. If the performer decides to instill more contrast, performer repeats appropriate steps until satisfied.
    d. If the performer decides to order additional views or a repeat with changes in the technical factors, informs technologist what is needed; may record. Performer examines additional radiographs as described above.
    e. When performer has determined that the examination has been completed, informs technologist.
    f. Performer decides whether to have post evacuation film(s) taken and which views to take.

23. Performer terminates procedure by returning to patient. Reassures and assesses how patient has tolerated procedure:

    a. Performer removes Foley catheter by opening balloon lumen and al-

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lowing water or air to flow out. Then gently removes catheter.

b. If pneumoperitoneum has been induced transabdominally, performer unplugs plastic cannula,tubing,or opens needle. Has table positioned at 20° to 25° head down, with patient in supine position.
   - i) Performer may attempt to express gas from abdomen. May attach syringe with saline solution to needle or tubing and aspirate gas.
   - ii) Performer gently removes needle or plastic cannula.
   - iii) Has dressing applied to puncture site.

c. Performer may explain to patient that side effects of some pelvic pain and mild staining of blood may be caused by the procedure and the use of a tenaculum. Advises patient to consult her gynecologist at once if there is severe pelvic pain or bleeding.

d. Indicates if so ordered that patient will have post-evacuation films taken and what will happen.

e. Performer arranges to have the patient brought to an appropriate recovery area to recline until the immediate effects of the procedure and the medication have abated and patient is free of shoulder pain in the upright position and/or to await post-evacuation filming.

f. If out-patient, makes sure that someone is present to escort patient home. If in-patient, arranges for proper escorting of patient to appropriate next location.

g. If appropriate, has sanitary clean up procedures carried out.

24. If performer judges that any emergency signs are in evidence on films, performer notifies patient's physician at once. If so requested, may report results at once to referring physician.

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25. Performer may record impressions of the procedure on patient's chart.

a. Preliminary findings.

b. How patient tolerated procedure.

c. Any special nursing follow-up recommended, post-evacuation films ordered, delayed hysterosalpingography ordered.

d. May sign chart or requisition sheet.

TASK DESCRIPTION SHEET

Task Code No. 5

This is page 1 of 7 for this task.

1. What is the output of this task? (Be sure this is broad enough to be repeatable.)

Pt. reassured;pelvic exam. and sounding performed; decisions made on whether to go ahead,on technique, on contrast medium;iodine based contrast medium instilled (under fluoroscopic control,fractionally,if so decided); decision made on filling uterine tubes; radiographs ordered;videotape and/or spot filming completed;complete set of radiographs approved;medical impressions,follow up care,orders for post-evacuation films recorded;MD notified of emergency signs.

2. What is used in performing this task? (Note if only certain items must be used. If there is choice, include everything or the kinds of things chosen among.)

Pt.'s x-ray requisition form,medical chart,radiographs,ultrasonograms;pen;phone;view boxes;sterile tray with lubricant,speculum,sound;antiseptic solution,swabs,probe,cannula,tenaculum forceps;syringes; iodine-based contrast medium;fluoroscope unit,TV monitor,spot film attachment videotape camera,screen; x-ray table;emergency cart and supplies;protective lead garments;sterile gown,gloves

3. Is there a recipient, respondent or co-worker involved in the task? Yes...(X) No...( )

4. If "Yes" to q. 3: Name the kind of recipient, respondent or co-worker involved, with descriptions to indicate the relevant condition; include the kind with whom the performer is not allowed to deal if relevant to knowledge requirements or legal restrictions.

Non-pediatric female patient to have radiography of female organs with contrast;radiologic technologist; referring MD;radiologist;gynecologist;clerk;nurse

5. Name the task so that the answers to questions 1-4 are reflected. Underline essential words.

Conducting hysterography or hysterosalpingography of a non-pediatric female pt. by deciding whether to go ahead based on records,pelvic examination,sounding, and scout film;reassuring pt.;deciding on technique and contrast medium; instilling medium transuterinely using cannula; observing and recording fractional filling using radiography and/or fluoroscopic control;spot filming and/or making videotape record as decided;ordering,approving radiographs;when completed removing instruments;recording medical impressions,follow-up care,orders for post-evacuation films;notifying MD of emergency signs.

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Performer receives the x-ray requisition form and medical information on a female patient scheduled for hysterography (radiographic study of the uterus with use of contrast medium) or hysterosalpingography (radiography of uterus and fallopian tubes after injection of opaque medium). Requisition may be for initial examination or may follow a prior radiographic study.

1. Performer reads the patient's medical history and requisition form to review the case or to become familiar with materials seen earlier in consultation in order to make decisions about the conduct of the radiographic study and check on the request of the referring clinician:
   a. Performer notes the patient's age, size and the nature and location of the suspected pathology, such as suspected blockage of the fallopian tubes, lesions or masses in the uterine cavity, etc.
   b. Performer notes any relevant test results;reads reports on any prior radiographic studies or plain films; examines radiographs on view boxes to become familiar with the area under study and the diagnostic information available. May review ultrasonograms if available.
   c. Performer notes any relevant medical information

OK-RP;RR;RR

6. Check here if this is a master sheet..(X)

This is new assignment to this number.

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such as history of uterine bleeding, vaginal infection, anomalies, inflammation, presence of cardiovascular or pulmonary disease. Notes whether there is a history of adverse reactions to contrast or prior radiographic procedures; notes whether patient has an infectious or communicable condition.

d. Performer notes whether the request is for complete study of uterus and fallopian tubes or just uterus. Notes any recommendations on technique.

e. Checks whether any orders given on pre-examination procedures done by patient at home or in hospital have been carried out; if not,arranges to have this done.

f. May call referring physician to obtain additional information.

g. Checks to see that patient has signed consent for procedure. If not, informs appropriate co-worker and either has examination delayed until written consent is obtained or arranges to obtain personally.

2. Performer greets patient in examination room. Attempts to reassure; explains what will be done so as to gain patient's cooperation. Depending on performer's assessment of the patient and the needs of the situation,performer may cover any or all of the following:

   a. May question about patient's symptoms in relation to the condition being studied. May collect additional medical history and ask about previous radiography, allergies. May determine whether patient may be pregnant.

   b. Performer may explain that patient will be asked to hold still from time to time. May indicate what will happen, what pain might be experienced, and what cooperation will be

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needed. Stresses need to maintain positions when ordered. Answers questions.

   c. If out-patient, performer may check whether there will be someone present to escort patient home after procedure is terminated.

   d. If appropriate, performer may describe the procedure and its risks and obtain consent signature from patient. (Does not proceed without signed consent.)

   e. Unless there are obvious contraindications to going ahead, performer has patient void to empty bladder. Has preliminary (scout film) radiograph of pelvic area taken (in dorsal lithotomy position).

3. Performer examines scout film as soon as it is processed:

   a. Notes whether the technical quality of the radiograph is adequate to demonstrate the organs under study. If not, indicates to technologist the needed technical adjustments or change in patient's position, or records.

   b. Performer inspects to see whether there is evidence of contrast medium from earlier study (such as barium), whether the patient's colon is sufficiently clear of feces and gas,and bladder is sufficiently empty for proper visualization of female organs; decides whether patient should be rescheduled.

4. If procedure is to continue, performer has patient remain in dorsal lithotomy position and prepares for pelvic examination:

   a. Reassures patient and explains what will be done.

TASK DESCRIPTION SHEET (continued)

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- b. Dons protective lead garment and sterile gown and gloves when appropriate.
- c. Performer has patient's vagina and cervix cleansed with antiseptic solution or does so personally. Makes sure fresh sterile gown and gloves are donned after cleansing.
- d. Performer may carry out a bi-manual examination of patient's vagina and note the size and position of the uterus.
- e. Performer uses water soluble lubricant and inserts a sterile Graves speculum (usually radiolucent) to expose the cervix. Notes the type of cervical os and the general condition of the cervix, whether there is evidence of laceration and repairs.

5. Performer may inspect the patency and size of the uterine cavity and the endocervical canal by sounding:

   - a. Performer adjusts the speculum to obtain the desired dilation.
   - b. Performer uses a sterile tenaculum forceps to grasp and hold the cervix (anterior or posterior lip depending on its position).
   - c. Inserts a sterile sound, being careful not to touch the sides of the vagina or rupture the uterus. Repeats if appropriate and judges the extent of any obstruction which might interfere with the procedure. Removes sound.
   - d. If obstruction is found, performer determines whether it is total,thus making it impossible to continue, whether it is partial and may be overcome with hydrostatic pressure during the procedure, or whether any partial obstruction requires that the patient be dilated by her gynecologist.

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   - e. Depending on evaluation and the circumstances, performer decides whether to have procedure terminated, delayed for dilation by attending gynecologist, rescheduled, or whether to use hydrostatic pressure and continue.

6. Performer decides whether to go ahead with the procedure based on the patient's clinical records, the prior radiographs and scout film, the information obtained from the patient, the pelvic examination, and the sounding:

   - a. Performer considers whether there have been changes in the patient's condition since the decision was made to do the procedure that are contraindications to going ahead. May have specialist or clinician called; discusses problems. Decides whether to proceed or not based on assessment of patient's current condition and any discussion.
   - b. If performer decides not to have procedure done, performer records reason for cancellation and any recommendations on chart, requisition, or appropriate form. May indicate need to have proper preliminary procedures carried out. May indicate to out-patient need to have patient revisit referring physician for further care and/or dilation. Informs staff of cancellation and discusses with patient. If appropriate, orders rescheduling or scheduling for alternative procedure.

7. If performer decides to proceed,makes final decisions on technique based on requisition sheet, scout film, clinical evidence and own examination. If appropriate, writes decisions on requisition sheet; informs appropriate co-

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workers so that materials selected and technical factors can be prepared or set.

- a. Performer may document corroborative finding that no pregnancy is evident.
- b. Performer decides whether he or she will be examining the fallopian tubes as well as the uterus.
- c. Performer decides on and orders sufficient aqueous iodine-based contrast solution to suit the needs of the study and the estimated size of the organs.
- d. Performer chooses appropriate instruments and sizes (such as for cannula), based on the size of the patient and the area of interest.
- e. Performer decides whether to instill medium fractionally.
- f. Performer decides whether to utilize fluoroscopic control with spot filming and/or videotape. If spot filming equipment uses cassettes, has cassette inserted. Chooses full, half, or quarter format and sets as appropriate. (If roll film attachment, checks that attachment is loaded with film or has this done.) Has technical factors set for fluoroscopy. May have videotape camera and screen set up and loaded.
- g. Performer may arrange to have patient dilated by attending gynecologist. If so, waits for indication that patient is ready.

8. Performer makes sure that materials are ready for procedure:

- a. Checks that all materials needed for the procedure are present on sterile tray, that emergency cart is present and that anyone to remain in room is properly shielded.
- b. Performer has a syringe prepared with the contrast medium selected.

List Elements Fully

Checks appearance of contrast medium to be sure there is no chemical deterioration, that medium is at room temperature, and that there is sufficient contrast for study. Makes sure that all the air in the syringe is replaced with the contrast material.

- c. Performer tests the patency of the cannula, making sure it has no obstruction.

9. When the patient and materials are ready performer proceeds to insert the self-retaining cannula:

- a. Performer may explain what will happen to patient. Checks that tenaculum forceps is in place.
- b. Performer inserts the sterile cannula into the cervix so that it opens into the uterine cavity. Reassures patient if there is any evidence of pain.
- c. Performer checks that the tenaculum has fixed the cannula with a proper grip. May apply traction to the tenaculum and cannula to correct the angulation of the uterus. Makes sure that the acorn tip of the cannula is placed so that it will properly retain the contrast solution once it is injected.
- d. Performer may remove the speculum.

10. Performer continues with the instillation of the contrast medium:

- a. Performer attaches syringe with contrast medium to the cannula.
- b If performer has not decided to use fractional filling or fluoroscopic monitoring to view instillation, performer injects the contrast solution slowly under a controlled, constant low or moderate pressure, using appropriate amount to fill uterus and, if so decided, fallopian tubes.

TASK DESCRIPTION SHEET (continued)

Task Code No. 5

This is page 5 of 7 for this task.

List Elements Fully

c. If performer has decided to utilize fractional filling and fluoroscopic control, performer positions the overhead fluoroscope unit over patient and positions patient or table so that the area under study will be shown most effectively on the TV monitor. Performer may have lights in room dimmed.

d. If a partial obstruction has been found in the uterine cavity or endocervical canal and performer decided to use hydrostatic pressure for dilation, performer uses syringe with contrast solution attached to the cannula; injects contrast under manually controlled pressure to provide adequate dilation. If this is not successful, performer may decide to have patient dilated by referring to private or attending physician as described above.

e. With fractional filling performer injects a small amount of the contrast solution under a constant low pressure.

  i) Performer may activate fluoroscope and watch the progress of the solution on the TV monitor.

  ii) If videotape equipment is to be used, performer activates when judged appropriate.

  iii) Performer may decide to make spot films while viewing on TV monitor. Activates spot film attachment and x-ray foot pedal as appropriate. If cassette attachment, may have technologist remove cassette as spots are snapped and insert additional cassettes, or does so personally. Turns off fluoroscope when observation is completed.

  iv) If performer decides on overhead radiographs, orders the appropriate projections required for study and has them processed for viewing before continuing.

List Elements Fully

11. Performer looks at the initial radiograph and/or any spot films on view boxes as soon as processed:

  a. Performer checks for technical quality and notes whether there is any need to adjust technical factors or have the patient's position adjusted. If so, indicates what is needed to technologist.

  b. Performer evaluates whether the uterine cavity is being properly filled and outlined.

  c. Performer determines whether there is evidence of blockage, resistance. If so, performer discontinues injection and attempts to find reason for obstruction. Uses fluoroscopy and/or overhead views to study the area in various appropriate projections.

12. If no initial obstruction is encountered, performer continues incremental filling of the uterus using radiography and/or fluoroscopic control, spot filming and/or videotape.

13. When the performer determines that the instillation of the uterus is completed,performer may decide whether to continue with the filling of the uterine tubes to study any suspected blockage or constriction.

  a. If performer decides not to continue, indicates this to staff and terminates as described below.

  b. If performer decides to continue, performer injects additional contrast material under steady low or moderate pressure. Utilizes fluoroscopy and/or overhead filming as described above.

  c. Performer notes filling of tubes and any spillage into peritoneal cavity while viewing on monitor.

TASK DESCRIPTION SHEET (continued)

Task Code No. 5

This is page 6 of 7 for this task.

List Elements Fully

14. Throughout the procedure the performer is alert for obstructions, abnormalities and the extent to which the patient is experiencing pain:

    a. If an abnormality is visualized performer may take spot films or order overhead films in various projections before continuing with instillation.
    b. Performer may interrupt instillation and use instant videotape replay to examine the progress of the filling at any point throughout the procedure as decided.
    c. If patient is experiencing pain, performer asks about the nature of the pain. Notes that cramp-like pain indicates that the contrast material is entering the peritoneal cavity. Reassures patient.
    d. If the patient reacts with extreme pain, performer may decide that there is evidence of blockage and may suspend the injection to investigate.
    e. If the performer decides that there is an obstruction in the tubes, performer suspends the instillation and attempts to determine the nature of the blockage using fluoroscopy and/or overhead filming.
    f. Performer may determine that a tubal spasm is responsible for the tubal occlusion (and pain).
        i) If so, performer may apply steady, controlled pressure using the syringe with contrast until the spasm is overcome.
        ii) Performer may decide to terminate study and have it rescheduled with prior administration of a tranquilizer.

15. Performer determines when to terminate the instillation and the fluoroscopic portion of the examination. Orders overhead radiographs, specifying any special views required.

List Elements Fully

16. Performer looks at the processed spot films and radiographs on view boxes as soon as they are ready:

    a. Determines whether the radiographs are technically adequate to demonstrate the area and condition under study and provide sufficient information to make possible a competent medical interpretation. Performer may ask opinion of another radiologist.
    b. Performer decides whether to order additional views, a change in the technical factors, a repeat of prior portions of the radiographic examination or to instill additional contrast. Considers the information already available on the radiographs, the way in which the patient responded to the procedure, the patient's condition, and her cumulative exposure.
    c. If the performer decides to instill more contrast, performer repeats appropriate steps until satisfied.
    d. If the performer decides to order additional views or a repeat with changes in the technical factors, informs technologist what is needed; may record. Performer examines additional radiographs as described above.
    e. When performer has determined that the examination has been completed, informs technologist.
    f. Performer decides whether to have post evacuation film(s) taken and which views to take. If performer has decided to recommend that procedure be repeated with prior administration of tranquilizer writes out requisition sheet.

17. Performer terminates procedure by returning to patient. Reassures and assesses how patient has tolerated procedure:

TASK DESCRIPTION SHEET (continued)

Task Code No. 5

This is page 7 of 7 for this task.

List Elements Fully	List Elements Fully

a. Performer gently removes the instruments from patient.
b. May explain that side effects of some pelvic pain and mild staining of blood may be caused by the procedure and the use of the tenaculum. Advises patient to consult her gynecologist at once if there is severe pelvic pain or bleeding.
c. Indicates if so ordered that patient will have post-evacuation films taken and what will happen.
d. Performer arranges to have the patient brought to an appropriate recovery area until the immediate effects of the procedure and the medication have abated and/or to await post-evacuation filming.
e. If out-patient, makes sure that someone is present to escort patient home. If in-patient, arranges for proper escorting of patient to appropriate next location.
f. If appropriate, has sanitary clean up procedures carried out.

18. If performer judges that any emergency signs are in evidence on films, performer notifies patient's physician at once. If so requested, may report results at once to referring physician.

19. Performer may record impressions of the procedure on patient's chart.

a. Preliminary findings.
b. How patient tolerated procedure.
c. Any special nursing follow-up recommended, post-evacuation films ordered.
d. May sign chart or requisition sheet.

TASK DESCRIPTION SHEET

Task Code No. 6

This is page 1 of 2 for this task.

1. What is the output of this task? (Be sure this is broad enough to be repeatable.)

Routine radiographic work read, interpreted; findings, conclusions and recommendations made and dictated; physician called about emergency signs; selected radiographs earmarked for study or library; material rejacketed and report placed for typing.

2. What is used in performing this task? (Note if only certain items must be used. If there is choice, include everything or the kinds of things chosen among.)

X-ray requisition forms; current routine radiographs, spot films; view box, prior radiographic materials; telephone; dictation equipment; pen; magnifying glass

3. Is there a recipient, respondent or co-worker involved in the task? Yes...(X) No...( )

4. If "Yes" to q. 3: Name the kind of recipient, respondent or co-worker involved, with descriptions to indicate the relevant condition; include the kind with whom the performer is not allowed to deal if relevant to knowledge requirements or legal restrictions.

Referring physician

5. Name the task so that the answers to questions 1-4 are reflected. Underline essential words.

Reading, interpreting and making recommendations on routine radiographic materials including review of requisition sheet and available prior films; notifying ordering physician of emergency signs; dictating findings and recommendations; and placing report for typing.

List Elements Fully

Performer reads and interprets routine radiographs on a scheduled basis.

1. Performer obtains jacketed radiographic work-ups containing the current set of radiograph(s) and spot film(s), the requisition sheet, and prior radiographic material for the patient (if available). Goes to reading area.

2. Reads the x-ray requisition form to learn reason for requested examination and relevant medical information from referring clinician, decisions made on technique, or medical observations noted during the procedure.

3. Performer places radiograph(s) on view box. May view earlier films as well. May use magnifying glass.

4. Performer reads and interprets:

   a. Decides whether any abnormalities, changes, or suspicious signs warrant the immediate attention of the patient's physician. If so, telephones physician at once and discusses findings.
   b. May request the opinion of a co-worker.
   c. Makes medical assessment.
   d. Decides what to report and what recommendations to make.

OK-RP;RR;RR

6. Check here if this is a master sheet..(X)

TASK DESCRIPTION SHEET (continued)

Task Code No. 6

This is page 2 of 2 for this task.

List Elements Fully	List Elements Fully
5. Performer dictates findings by explaining what appears on the films. Describes worrisome or suspicious signs, obvious abnormalities and/or changes over time, referring to earlier films. (Might indicate presence of artifacts which do not have medical significance). Indicates what implications can be drawn from findings and what conclusions and/or courses of action are warranted, including need for additional studies, tests, or courses of treatment. Dictates report in the style: There is ...on.... It has the characteristics of.... I believe that this indicates.... It is necessary to determine whether.... This can be done by.... 6. May decide whether any of the material is unusual or of special interest and warrants inclusion in museum library or should be used for study purposes. Marks jackets appropriately if so decided. 7. Returns radiographic material, requisition sheet, and tape of dictation to proper jacket, and places to be picked up for typing.	

TASK DESCRIPTION SHEET

Task Code No. 20

This is page 1 of 2 for this task.

1. What is the output of this task? (Be sure this is broad enough to be repeatable.)

Preliminary respiratory radiograph(s) assessed; complete set of tomograms ordered and approved; medical impressions recorded.

2. What is used in performing this task? (Note if only certain items must be used. If there is choice, include everything or the kinds of things chosen among.)

X-ray requisition form and patient's chart; respiratory tomogram scout films; view boxes; pen

3. Is there a recipient, respondent or co-worker involved in the task? Yes...(X) No...( )

4. If "Yes" to q. 3: Name the kind of recipient, respondent or co-worker involved, with descriptions to indicate the relevant condition; include the kind with whom the performer is not allowed to deal if relevant to knowledge requirements or legal restrictions.

Radiologist; radiologic technologist

5. Name the task so that the answers to questions 1-4 are reflected. Underline essential words.

Directing respiratory tract tomography of any patient by reviewing preliminary tomograms; selecting positions, level, amplitude and number of "cuts"; reviewing tomograms; ordering additional tomograms; deciding when examination is completed; recording medical impressions.

List Elements Fully

Performer receives the preliminary tomograms of a patient's respiratory system (such as of the larynx, trachea, bronchi and/or lungs), requisition sheet, and medical information on a patient after scouts have been taken and processed by a radiologic technologist.

1. Performer reads the patient's requisition form and relevant information to become familiar with the case. Notes reasons and circumstances for ordering the procedure and suspected pathology. Notes any medically relevant information. Notes type of tomography motion employed.

2. Performer views preliminary (scout) tomograms on view boxes. Performer judges whether the area under study has been localized visually.

3. Performer selects the position(s), levels, amplitude (intervening distances) at which the tomograms should be made and the number of "cuts." Indicates orders to technologist. May suggest a change in technical factors. May consult with another radiologist.

4. Performer views the set of tomograms after they have been processed and judges if they are technically adequate to demonstrate the area under study for medical interpretation and/or localization.

OK-RP;RR;RR

6. Check here if this is a master sheet..(X)

This is new assignment to this number.

TASK DESCRIPTION SHEET (continued)

Task Code No. 20

This is page 2 of 2 for this task.

List Elements Fully	List Elements Fully
a. Performer may decide on a level to be further defined. May decide on more cuts at shorter intervening distances for any given level and patient position. May ask for a change in technical factors. Explains what is needed to technologist. b. Performer examines additional tomograms as processed until satisfied with set. 5. Performer may record preliminary findings on patient's chart. May sign chart or requisition sheet.	

TASK DESCRIPTION SHEET

Task Code No. 66

This is page 1 of 3 for this task.

1. **What is the output of this task?** (Be sure this is broad enough to be repeatable.)

Clinical research problem in diagnostic radiology formulated, recorded in written form or transmitted orally; decision made whether to pursue personally.

2. **What is used in performing this task?** (Note if only certain items must be used. If there is choice, include everything or the kinds of things chosen among.)

Literature, equipment, materials in diagnostic radiology; results of literature review; requests for research proposals; pen, paper or dictating equipment

3. Is there a recipient, respondent or co-worker involved in the task? Yes...(x) No...( )

4. If "Yes" to q. 3: Name the kind of recipient, respondent or co-worker involved, with descriptions to indicate the relevant condition; include the kind with whom the performer is not allowed to deal if relevant to knowledge requirements or legal restrictions.

Supervisor, radiologists; radiology residents

5. **Name the task** so that the answers to questions 1-4 are reflected. Underline essential words.

Formulating a problem for clinical research in diagnostic radiology by becoming aware of general areas for research; identifying the nature of the problem, its purpose, establishing its need; articulating problem in theoretical, fundable and/or operational terms; writing, dictating or transmitting formulated problem orally to supervisor, colleagues or students; deciding whether to pursue personally.

List Elements Fully

Performer formulates a problem for clinical research in diagnostic radiology as a result of:

a. Request by supervisor to evaluate a new procedure, type of material, equipment, or technique so that department can come to conclusion about adopting, purchasing, or eliminating from use.
b. Request by student(s) under tutelage of performer, or request by colleague for ideas to be used in research that such persons will undertake.
c. Request to develop a proposal in relevant research for purposes of obtaining research funds.
d. Personal or professional interest of performer in the pursuit of clinical research.

1. Performer may become aware of possible areas or subjects for clinical research in diagnostic radiology by any or all of the following means:

   a. General interest on the part of clinical practitioners in issues of:

      i) Improvement of the diagnostic quality of the results of radiologic procedures such as greater detail, definition, and sharpness of images.
      ii) Improvement of patient safety such as reduc-

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6. Check here if this is a master sheet..(x)

This is new assignment of task to this number.

TASK DESCRIPTION SHEET (continued)

Task Code No. 66

This is page 2 of 3 for this task.

List Elements Fully

List Elements Fully

tion of incidence and severity of complications, reduction in necessary exposure to ionizing radiation.

iii) Improvement of diagnostic accuracy, such as demonstrating valid relationships between observed radiographic details and proven pathological or normal conditions.

iv) Reduction of cost through less expensive means, simplification and/or standardization of procedures; elimination of unnecessary time, equipment, materials, or personnel.

b. Regular or intermittant review of the literature in the field, attendance at professional meetings, case conferences, departmental meetings, and/or conversations with colleagues and students.

c. Personal interest in working with the equipment, materials and techniques of the field and/or awareness of events and cases in performer's own experience.

d. Presentation to the performer of specific areas for which research is needed by others, such as supervisor, or in the form of requests for research proposals delineating areas invited for funding.

2. If not already done, performer first formulates the general idea for the research mentally or in written form. May discuss with colleagues and/or students or supervisor.

   a. Considers the nature of the problem, such as one dealing with comparison of existing procedures, equipment, materials; or introduction of new, untried procedures, equipment or materials; or a new application or modification of existing procedures, equipment or materials.

   b. If not already done, considers the purpose of the research, such as to provide greater patient safety, more definitive information, more diagnostic accuracy, and/or involve greater convenience or cost savings.

   c. Unless receiving/an assignment, performer may decide whether there is a need for the research:

      i) May assign the task of literature review to shed light on this subject to subordinate or student, or decides to do personally. If assigning, explains what areas to investigate and what is wanted; discusses.

      ii) Based on the literature review, performer decides whether the original formulation justifies continuing with the idea and/or requires modification of the research problem to take acccunt of accumulated reports in the literature and current practice.

      iii) If appropriate, modifies.

3. If appropriate, performer may formulate the research idea in terms of existing theoretical or professional terminology representative of the disciplines involved.

4. Performer articulates a working statement of the research problem as appropriate:

   a. May state a working hypothesis to be proved or disproved in clinical practice, with or without experimental design.

   b. May state an expected set of outcomes based on use or nonuse of a given procedure, a given piece of equipment, use of particular materials.

TASK DESCRIPTION SHEET (continued)

Task Code No. 66

This is page 3 of 3 for this task.

List Elements Fully	List Elements Fully
c. May state the need to collect a specific set of data to provide descriptive information for later use and/or analysis.	
d. May state the need to build, construct, design equipment or materials to produce given results, based on general or specific principles.	
e. Attempts to articulate the problem in operational terms.	
5. If performer decides to engage in the research personally, may decide to proceed to the formulation of the research design, to gaining approval to carry out the design, to supervision and/or carrying out of the research, analysis and interpretation of results, and to reporting of the results.	
6. If performer has been requested to formulate the research problem by supervisor, student, or colleague, performer articulates the problem orally or in writing as appropriate. May use dictating equipment. May articulate problem in language appropriate to requirements of possible funding agency.	

TASK DESCRIPTION SHEET

Task Code No. 67

This is page 1 of 3 for this task.

1. What is the output of this task? (Be sure this is broad enough to be repeatable.)

Literature relevant for clinical research topic in diagnostic radiology compiled, reviewed, ordered, copied, cited, as appropriate; bibliography prepared, annotated, summarized, selected from; literature review set aside for use or presented and discussed.

2. What is used in performing this task? (Note if only certain items must be used. If there is choice, include everything or the kinds of things chosen among.)

Library catalogues; books; journals; log books; case studies; manuscripts; manufacturers' manuals and literature; paper; index cards; pen; order forms; folders; telephone; photocopier

3. Is there a recipient, respondent or co-worker involved in the task? Yes...(X) No...( )

4. If "Yes" to q. 3: Name the kind of recipient, respondent or co-worker involved, with descriptions to indicate the relevant condition; include the kind with whom the performer is not allowed to deal if relevant to knowledge requirements or legal restrictions.

Supervisor, professor and/or colleagues; librarians

5. Name the task so that the answers to questions 1-4 are reflected. Underline essential words.

Conducting literature review for clinical research problem in diagnostic radiology by determining nature of problem, relevant subjects in literature, sources, criteria for evaluation; obtaining literature, evaluating; preparing summaries, annotated bibliography; arranging for copying, purchase, borrowing, or doing personally; presenting bibliography and documents or setting aside for own use.

List Elements Fully

Performer conducts literature review in connection with clinical research problem in diagnostic radiology as a result of:

a. Receiving assignment from supervisor and/or professor.
b. Request from co-worker.
c. Decision to conduct literature review personally for own research undertaking.

1. Performer determines the nature of the research problem, the type of literature to be reviewed, its scope, the kind of information or sources to make note of or needed, and whether sources are to be annotated, selected and/or summarized as well as compiled.
    a. If performer is to do literature review as a result of assignment or request in connection with someone else's research, discusses what is wanted with person making request. May take notes. Asks questions to avoid any misunderstanding of what is wanted.
    b. Performer notes the nature of the clinical research problem to identify the type of literature to be examined.
    c. Notes whether the literature review is to include reports on past research, current clinical practices, reports on new equipment or materials, theoretical material and/

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6. Check here if this is a master sheet..(X)

This is new assignment of task to this number.

TASK DESCRIPTION SHEET (continued)

Task Code No. 67

This is page 2 of 3 for this task.

List Elements Fully

or text books, case studies, legal or professional regulations on technical or medical practice, descriptions of equipment, manuals, patient information; literature on scientific method, research design, statistical procedures, computer programs; funding sources and guidelines.

d. Notes the time framework to consider for sources, and any cut-off on examination of literature before a given date.
e. Notes whether literature is to be limited to U. S. or international sources.
f. Notes criteria to be used to judge relevance of material such as procedural and/or technical descriptions, theoretical formulations, statistical formulae, quantitative data, examples of research designs, issues involved to be illuminated, references to particular terms.
g. Performer determines or decides whether performer is to bring copies and/or order literature for in-house use, copy appropriate citations, prepare summaries, prepare underlined copies of pages or annotated notes, and/or prepare bibliography.
h. If performer will be enabled to order documents for sale, determines whether there are any limitations on costs, total or per document, criteria for photocopying or purchase, and procedures to carry out in ordering or purchasing.

2. Performer notes or discusses the type of resources available for literature review such as public, university, medical school, or hospital libraries for books and journals; departmental or other professional case study files or log books for clinical case histories; manufacturers for product de-

List Elements Fully

scriptions and/or manuals; bookstores; personal libraries; known unpublished manuscripts.

a. Decides on order in which to visit research or library facilities.
b. If appropriate, drafts letters to publishers, other professionals, or vendors requesting literature; signs or has letters approved and mailed.

3. When using libraries or other indexed references, performer may determine the appropriate subject categories, journals and/or code system listings under which relevant literature may be found.

a. May refer to the Index Medicus, Scientific Citation Index, Anatomical-Pathological Code System.
b. May use book reviews in journals, journal indexes, library subject catalogues.
c. May start by preparing a bibliography of material to be reviewed. May discuss with librarians.

4. In reviewing material to judge whether it is relevant to the needs of the projected research, performer obtains document or reviews case material:

a. May start by going over each item in bibliography of material to [illegible] reviewed.
b. May skim material, note summaries, conclusions. Notes whether points of interest are covered, whether relevant criteria seem to be met.
c. If the material seems relevant, performer may decide to purchase, have photocopied or do personally, copy down by hand, or arrange to borrow.

TASK DESCRIPTION SHEET (continued)

Task Code No. 67

This is page 3 of 3 for this task.

List Elements Fully

i) May have selected sections copied. May simply list full citation, location, and/or cost of purchase.

ii) May write critical evaluation of what is included and how subjects of interest are treated.

iii) May copy relevant passages and list source for later footnoting.

d. Performer may compare the treatment of a particular subject in more than one source and note where subject is most comprehensively, most critically and/or most completely covered. May consider whether a source is appropriate for use and/or is duplication of similar material already on hand. May decide to substitute newer material for older material already seen.

5. Performer may decide when he or she has collected enough relevant, competent material on the history of the subject, current practice, current problems, indications for the direction of new research, theoretical questions, and/or mechanical or technical considerations.

   a. With regard to method, may decide if there is adequate coverage on what research or experimental design model(s), data collection instruments are relevant or in use, criteria for application, pitfalls, problems, statistical manuals.
   b. May make sure that there is adequate information on legal, financial, engineering or institutional aspects related to the research.

6. As decided, performer returns unused materials. Copies, purchases, orders or borrows wanted materials. Follows appropriate procedures.

List Elements Fully

7. If not already done and required, performer may prepare an annotated bibliography, prepare summaries of documents. May arrange quotations, summaries and/or copies under appropriate subject headings in folders or on file cards.

8. Performer may note or record own opinion on whether the research undertaking as formulated still appears necessary, relevant, and/or viable, whether it should be modified, reformulated, narrowed or expanded.

9. Depending on whether literature review is for own use or for use of someone else, performer presents accumulated documents, bibliography and/or notes and copies to person requesting review or sets aside for own use.

   a. Performer may discuss at any time with person requesting or colleague. As a result of discussion, performer may repeat any steps described above as appropriate.
   b. May add to literature review and acquisition from time to time during course of research.
   c. Performer may recommend acquisition for the institution's own library.

TASK DESCRIPTION SHEET

Task Code No. 68

This is page 1 of 5 for this task.

1. What is the output of this task? (Be sure this is broad enough to be repeatable.)

Working model for research design, research budget designed, submitted; research staff, equipment, materials set up; subjects selected; research carried out; results recorded, processed, analyzed; report prepared, submitted, distributed; research project terminated.

2. What is used in performing this task? (Note if only certain items must be used. If there is choice, include everything or the kinds of things chosen among.)

Literature review; funding proposal guidelines; materials in diagnostic radiology used in research; data collection forms; data processing equipment; paper; pens; photocopying equipment

3. Is there a recipient, respondent or co-worker involved in the task? Yes...(x) No...( )

4. If "Yes" to q. 3: Name the kind of recipient, respondent or co-worker involved, with descriptions to indicate the relevant condition; include the kind with whom the performer is not allowed to deal if relevant to knowledge requirements or legal restrictions.

Supervisor; colleagues in department; research staff; patient subjects; vendors; funding agency staff; administrative staff

5. Name the task so that the answers to questions 1-4 are reflected. Underline essential words.

Preparing research design in clinical diagnostic radiology; supervising research; analyzing, evaluating results; and preparing report by reviewing formulation of problem and purpose; selecting a research model; preparing proposal and/or budget; staffing and assigning work; selecting subjects; obtaining materials; supervising research; preparing and analyzing data; evaluating results; making recommendations; preparing report; terminating research; distributing report if appropriate.

List Elements Fully

Performer prepares the research design, has it approved, supervises the research, analyzes, evaluates the results, and prepares report on clinical research in diagnostic radiology, as a result of:

a. Receiving the formulation of a research problem from supervisor, and/or as a result of a departmental decision.
b. Decision to carry out work after having formulated the research problem personally.

1. The formulation of the research problem may have been done as a result of:

    a. Request by supervisor to evaluate a new procedure, type of material, equipment, or technique so that department can come to conclusion about adopting, purchasing, or eliminating from use.
    b. Request to develop a proposal in relevant research for purposes of obtaining research funds.
    c. Personal or professional interest of performer in the pursuit of clinical research in this area.

2. The purpose of the research may be for one or more of the following:

    a. Improvement of the diagnostic quality of the results of radiologic procedures, such as greater de-

OK-RP;RR;RR

6. Check here if this is a master sheet..(x)

This is new assignment of task to this number.

TASK DESCRIPTION SHEET (continued)

Task Code No. 68

This is page 2 of 5 for this task.

List Elements Fully

tail, definition, and sharpness of images.

- b. Improvement of patient safety such as reduction of incidence and severity of complications, reduction in necessary exposure to ionizing radiation.
- c. Improvement of diagnostic accuracy, such as demonstrating of reliable, valid relationships between observed radiographic details and proven pathological or normal conditions.
- d. Reduction of cost through less expensive means, simplification and/or standardization of procedures, elimination of unnecessary time, equipment, materials or personnel.

3. If not already done, performer reviews the working statement of the research problem, which may be a working hypothesis, a given set of expected outcomes, a plan to collect descriptive data, a plan to design a type of equipment, or a design for comparison of alternative procedures, equipment or materials.

   - a. Determines what is to be learned in operational terms.
   - b. Determines whether an experimental design and/or descriptive research design for an inquiry is warranted.

4. Performer determines an appropriate model for the given research, such as experimental model, descriptive model, the types of data required, the type of subjects involved:

   - a. If not already done, may decide to do a literature review on methodology or decides to have this done.
   - b. If not already done, may do a literature review on the subject to be researched or decides to have this done.
   - c. If assigning literature review to a subordinate, describes what is

List Elements Fully

needed and whether literature is to be screened, annotated, summarized, compiled, and/or collected. Discusses as appropriate including purchase options.

   - d. If and when literature review has been done, performer reviews the material:
     - i) Evaluates the history of the subject, current practice, current problems, indications for the direction of new research, theoretical questions and/or mechanical or technical considerations.
     - ii) Considers and evaluates what research or experimental design model(s) and data collection instruments are available, relevant, and in use, the criteria for their application, pitfalls, problems, statistical manuals.
     - iii) May review legal, financial, engineering or institutional aspects related to the research.
   - e. Performer considers the resources available to performer in institution or to be requested in terms of time, money, staff, equipment, materials, space, data processing, and human subjects needed.
   - f. Based on the analysis, performer decides on a working model for the research. May include any or all of the following:
     - i) The staging of the research with respect to time periods.
     - ii) The standard procedures to be followed at each stage.
     - iii) The "treatments" to be carried out with respect to pre-test/post-test conditions, control group, alternative "treatments," placebos, if appropriate.
     - iv) The variables that will be considered, such as the one to be

TASK DESCRIPTION SHEET (continued)

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systematically applied, related moderator or intervening variables, criterion variables against which to evaluate results.

- v) How the data on the variables will be operationally defined, collected, quantified.
- vi) The human subjects of the study, their demographic or research-relevant characteristics, their method of selection, the number of subjects needed, how consent will be solicited and obtained, follow-up procedures, ethical considerations. Covers sampling procedures if appropriate.
- vii) Data processing techniques.
- viii) Measures or means of testing statistical validity, reliability, significance, based on the nature of the data.

g. Performer may prepare a working guide for the conduct of the research presenting the decisions made and describing the design.

5. Performer may prepare a budget for the research detailing any relevant training period for staff, staff needs, wages and salaries, consumables, equipment, rent and maintenance, data processing, and indirect costs by stage and/or by time period.

   a. Performer may consider what costs must be incurred in addition to normal institutional operations if appropriate, what contributions could be made by manufacturers, the institution, or other sources.
   b. Performer may consider who will be carrying out the work, whether existing staff, new staff, their percentage of time in research, their qualifications, salary level; how recruitment will be done.

List Elements Fully

6. If appropriate, performer may prepare a research proposal following the requirements of a funding agency for format, content and outline:

   a. May refer to literature review as argument for conducting proposed research.
   b. May prepare a budget following specified accounting or problem-oriented line item break-downs.
   c. May work with a subordinate or colleague.
   d. May submit proposal to funding agency, department, or colleagues for discussion and/or approval:

      i) May appear in person and answer questions.
      ii) May modify research proposal as requested.

7. Once the research has been approved, performer may determine how much of the research is to be done personally, whether performer will supervise only, and/or whether staff will be under performer's direction. If appropriate, performer carries out any or all of the following or arranges to obtain assistance:

   a. Performer may carry out recruitment and training of staff, including teaching the standard methods to carry out the research design, how to collect and record data, the ethical treatment of human subjects.
   b. May select and obtain human subjects, based on research design, or have this done. Performer carries out ethical practices with respect to informing human subjects of the features of the research, risks to themselves, probability of benefit or harm in receiving the various alternative "treatments." Performer makes sure that subjects are in no way coerced, have full options

TASK DESCRIPTION SHEET (continued)

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List Elements Fully

to decline, and have a clear view of the agreement between the investigator and themselves, their right to withdraw at any time, and/or to receive follow-up attention.

c. Performer arranges to obtain appropriate equipment; gets instruction in use; may design how to calculate costs of use.

d. Makes clear and specific work assignments to staff. May develop personnel policies as appropriate. May have these recorded and distributed.

8. Performer supervises and/or carries out the research as designed, adjusting to contingencies, unexpected results, administrative and/or personnel problems as they evolve.

   a. Performer attempts to maintain standardization in the research conditions, honesty in the collection of the data, and a responsible concern for the welfare of the human subjects.
   b. Maintains strict adherence to safety regulations, legal requirements and ethical standards in relation to the human subjects.
   c. Performer may design format for collecting and presenting data.
   d. During the research period performer may have records kept on results; may keep a research diary; may make out regular reports or in other ways engage in descriptive recording of the work. May review work of staff as quality check.

9. Performer may organize the research data for purposes of analysis. Defines success criteria; decides how to group the data; decides how to compare with existing literature in the field.

List Elements Fully

Has data prepared for appropriate processing. Evaluates the significance of unexpected contingencies and complications.

10. Performer analyzes the data in qualitative, descriptive, and/or statistical quantitative terms:

   a. For descriptive data determines what the data indicate or suggest, the implications for policy or theory.
   b. For experimental data determines whether the hypothesis has been justified, such as whether the procedure, equipment, or materials under study had the anticipated effect on patient safety, incidence and severity of complications, accuracy of diagnosis, clarity of diagnostic images, departmental costs, or simplicity of procedure. Notes unexpected contingencies.
   c. Details the statistical validity, reliability, significance of the findings and interprets.
   d. Indicates the influence of the procedure, practice, or item being studied in terms of the purpose, such as patient safety, diagnostic accuracy or cost savings. Indicates the effects of other influences. Formulates the conclusions to be drawn from the findings and the scope with which they can be generalized.
   e. Performer determines the implications of the findings with respect to practice in clinical work. Recommends or discourages adoption of the procedure, practice, or item being researched; qualifies with respect to types of human subjects, particular circumstances.

TASK DESCRIPTION SHEET (continued)

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List Elements Fully	List Elements Fully
f. May relate the findings to the literature in the field.	
11. Performer may prepare a report on the research, describing the research design, what was done, data collection, results, findings, evaluation, and significance as appropriate for submission to a journal and/or departmental or professional meeting.	
a. May prepare visual support documents such as tables, charts, slides, or has this done.	
b. May write report, have it edited and put in final written form. May assign staff to do some of the writing and/or editing. May edit only.	
c. Indicates to appropriate staff member or agency that research is completed, and submits report.	
d. May prepare to make oral presentation at departmental meeting and/or professional meeting or case conference.	
e. May have report reproduced and distributed or decides to do personally. May submit for publication.	
12. As appropriate, performer dismantles research, such as terminating staff, reassigning; arranging for disposition of materials, or has this done. If appropriate, arranges for follow-up care or disclosure of results to human subjects.	

TASK DESCRIPTION SHEET

Task Code No. 310

This is page 1 of 2 for this task.

1. What is the output of this task? (Be sure this is broad enough to be repeatable.)

GI and biliary tract radiographs selected for case conference, lecture presentations, or inclusion in library; materials replaced or prepared for entry in library or use in presentation.

2. What is used in performing this task? (Note if only certain items must be used. If there is choice, include everything or the kinds of things chosen among.)

Selected radiographs of GI and biliary tracts; related case history materials; log book; view boxes

3. Is there a recipient, respondent or co-worker involved in the task? Yes...(x) No...( )

4. If "Yes" to q. 3: Name the kind of recipient, respondent or co-worker involved, with descriptions to indicate the relevant condition; include the kind with whom the performer is not allowed to deal if relevant to knowledge requirements or legal restrictions.

Resident

5. Name the task so that the answers to questions 1-4 are reflected. Underline essential words.

Selecting gastrointestinal and biliary tract radiographic materials for use in case conference or lecture presentations or for inclusion in library, by reviewing materials and related case histories, discussing with resident; selecting radiographs as needed; arranging for personal use or jacketing for library; arranging for return of unused materials.

List Elements Fully

Performer selects and supervises the entry of radiographic materials on the gastrointestinal and biliary tracts for inclusion in the library and/or materials for use in own presentations at lectures or case conferences.

1. Performer reviews radiographic materials entered into log book, specially brought to the performer's attention, and/or suggested by a resident working with performer. Examines on view box and reads accompanying information and comments; reads log book notes, official diagnostic reports or other related material.
   - a. May have resident research the medical history of specific cases.
   - b. Performer considers the quality of the radiographs, their instructional value as representative of pathological conditions and/or unusual aspects of special interest.
   - c. When reviewing for possible inclusion in library, considers materials already on hand; decides whether materials are good additions and/or should replace material on hand.
   - d. If performer is considering for own presentation, determines to what extent radiographs demonstrate the points to be stressed or make good subjects for case study discussions.

OK-RP;RR;RR

6. Check here if this is a master sheet..(X)

TASK DESCRIPTION SHEET (continued)

Task Code No. 310

This is page 2 of 2 for this task.

List Elements Fully	List Elements Fully
e. Considers or has assistant consider material in department library and treats similarly.	
2. Performer may discuss the radiographs with resident when reviewing. Shares opinions and evaluations or asks basis for resident's selections and discusses.	
3. Performer decides what materials to use in own conference or lecture presentation(s). Selects related documentation and sets aside for later use.	
4. Performer decides what new materials to include in the library. Arranges to have resident copy, make library jackets for library and/or for teaching uses. Has copies presented to librarians together with descriptive materials.	
5. Has resident return all materials not set aside for use.	

TASK DESCRIPTION SHEET

Task Code No. 311

This is page 1 of 2 for this task.

1. What is the output of this task? (Be sure this is broad enough to be repeatable.)

Decision made on ordering and/or deciding on type of urographic procedure to order; recommendations made on technique, anesthetic, preparatory patient regimen, as appropriate; record entered and placed for scheduling.

2. What is used in performing this task? (Note if only certain items must be used. If there is choice, include everything or the kinds of things chosen among.)

X-ray requisition form and patient's chart; relevant radiographic and ultrasonographic materials; telephone; view boxes

3. Is there a recipient, respondent or co-worker involved in the task? Yes...(X) No...( )

4. If "Yes" to q. 3: Name the kind of recipient, respondent or co-worker involved, with descriptions to indicate the relevant condition; include the kind with whom the performer is not allowed to deal if relevant to knowledge requirements or legal restrictions.

Physician requesting urographic procedure(s); urologist, nephrologist, clinician; anesthesiologist; secretary or clerk

5. Name the task so that the answers to questions 1-4 are reflected. Underline essential words.

Deciding on type of urographic procedure(s) to order for any patient in consultation with referring physician and/or specialists, by reviewing case history and relevant materials, discussing, and deciding what procedure(s) to order; recommending appropriate techniques; deciding on anesthetic, preparatory patient regimen; recording decisions and recommendations; arranging for scheduling.

List Elements Fully

Performer decides on what urographic examination to order for a patient upon receipt of a request from an ordering physician on an x-ray requisition form, by phone, or in person. The examination(s) requested include common procedures using contrast medium, such as IVP's, or special urographic procedures; the request may be for purposes of initial diagnosis, for further information after an earlier radiographic examination has uncovered a suspected pathological condition, or for a repeat of an earlier examination. Studies ordered can include any procedure for radiographic study of the urinary tract including nephrotomography.

1. Performer reads the x-ray requisition form and the patient's history to learn the nature of the problem and the reason for the request.
    a. If the condition or the nature of the request warrants it, performer may arrange to discuss request with patient's attending physician, urologist or nephrologist.
    b. Performer studies the medical history of the patient and any radiographic materials or ultrasonograms resulting from procedures already carried out, prior radiographs on file, or interpretations already prepared by other radio-

OK-RP;RR;RR

6. Check here if this is a master sheet..(X)

TASK DESCRIPTION SHEET (continued)

Task Code No. 311

This is page 2 of 2 for this task.

List Elements Fully

logists. (Performer places radiographs on view boxes.)

c. The performer notes whether the patient (if female) is pregnant; notes radiographic history; notes whether patient has a communicable or infectious condition.

d. If the performer finds that the information provided is inadequate, performer arranges to have other materials sent or discusses needed information with relevant physician.

e. Performer decides whether there are contraindications to the procedure(s) requested such as adverse reactions to prior studies, allergy to the contrast medium, or the degree of radiation exposure involved.

f. Performer considers any contraindications in relation to the need for additional information and in relation to the severity of the patient's symptoms, the suddenness of the appearance of symptoms, and the extent of definition on any current radiographs. Performer considers alternative studies. May discuss with another radiologist or appropriate specialist.

2. Performer decides, based on the information and any discussions, whether to approve the request, order additional or alternative studies, or to reorder earlier studies (such as renal vein renin study if lab test results show that the renal vein(s) were not entered), or to recommend against urography.

    a. If performer recommends against all urography, discusses with ordering physician and writes reasons on patient's chart.

    b. If performer and physician agree on initial request or on additional or alternative studies, performer writes what was decided on the patient's chart.

List Elements Fully

3. Performer decides on technique to recommend, depending on nature of study and patient's condition. Discusses with nephrologist if appropriate. Decisions on technique include such things as entry site for contrast medium (as in renal vein renin study), type of intravenous pyelogram (study of kidney and ureter), number and depth of cuts for tomograms of the kidney (nephrotomograms), etc.

    Performer may decide on use of anesthetic if appropriate; may discuss with anesthesiologist.

    Performer decides on the preparatory regimen to prescribe for patient (such as special diet), whether to prescribe standard regimen for given study or special regimen. May order procedures to prevent infection or contamination of the patient or environment.

4. Performer writes orders, recommendations on technique, decisions on anesthetic and prescriptions for patient's preparatory regimen on patient's chart explicitly so that physicians, nurses, technologists and other personnel can prepare patient or be scheduled for work.

5. Performer gives information to secretary for scheduling. Signs requisition sheet if appropriate.

TASK DESCRIPTION SHEET

Task Code No. 312

This is page 1 of 5 for this task.

1. What is the output of this task? (Be sure this is broad enough to be repeatable.)

Decision on whether to go ahead with IVP or allergy test based on scout film and contraindications; contrast medium test dose injected; patient's reaction evaluated; emergency care administered;full dose of contrast solution injected or infused as decided; orders given on sequence, special views, or change in technical factors for IVP's; complete set of IVP's approved; medical impressions and recommendations recorded.

2. What is used in performing this task? (Note if only certain items must be used. If there is choice, include everything or the kinds of things chosen among.)

X-ray requisition form and patient's chart; scout film; view boxes; prepared procedure tray with materials needed for test dose and full dose of iodine based contrast solution; materials for IV infusion; materials and equipment on emergency cart; telephone; pen; atropine or antihistamine

3. Is there a recipient, respondent or co-worker involved in the task? Yes...(X) No...( )

4. If "Yes" to q. 3: Name the kind of recipient, respondent or co-worker involved, with descriptions to indicate the relevant condition; include the kind with whom the performer is not allowed to deal if relevant to knowledge requirements or legal restrictions.

Any non-pediatric patient to have IVP examination;referring MD;attending clinicians,radiologists;radiologic technologist;nursing and clerical personnel

5. Name the task so that the answers to questions 1-4 are reflected. Underline essential words.

Conducting intravenous pyelography (IVP) examination of any non-pediatric patient by checking scout film and interviewing patient;deciding whether there are contraindications;if routine request,deciding on infusion or injection method; injecting test dose of iodine based contrast medium; observing reactions and deciding on whether to proceed;administering full dosage and/or providing emergency care;ordering special views or change in technical factors;deciding when examination is completed by viewing IVP's; recording medical impressions and needed nursing follow-up.

List Elements Fully

Performer receives the x-ray requisition form and medical information on a patient scheduled for intravenous pyelography (IVP) (radiography of the kidney and ureter using contrast medium that is introduced through a vein).

1. Performer reads the patient's requisition form and relevant information to become familiar with the case or to review materials seen earlier (in consultation). Notes reasons for ordering the procedure and suspected conditions.
   a. If patient is scheduled for a routine IVP, performer reviews relevant medical information and technique requested by ordering MD. Notes whether request for intravenous injection or infusion is appropriate for condition to be studied and/or whether minute sequence IVP is called for.
   b. If patient is scheduled for a minute sequence IVP or an infusion based on a prior consultation, performer notes recommendations on technique. Reviews results of earlier examinations. May view prior radiographs on view box and examine problem areas. Notes possible need for non-standard views depending on the suspected pathology.
   c. Checks to see that patient has signed consent for

OK - RP;RR;RR

6. Check here if this is a master sheet..(X)

TASK DESCRIPTION SHEET (continued)

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List Elements Fully

procedure. If not, informs appropriate co-worker. Terminates examination or delays it until written consent is obtained.

d. Performer notes whether patient has undergone allergy test for contrast medium.

e. Notes whether patient has an infectious or communicable condition; whether female patient may be pregnant.

2. Unless scout film is ready on view box, performer orders scout film and examines on view box when ready.

   a. Performer considers whether the scout film adequately demonstrates the area under study. If not, indicates changes needed in technical factors or patient positioning to technologist, or records on requisition sheet.
   b. Performer notes whether gas, feces, or barium traces (from earlier study) obstruct view and must be cleared before procedure can be done. If so, performer writes what is needed on requisition form.

3. Performer greets patient in examination room. Attempts to reassure; explains what will be done. May question patient about symptoms in relation to the condition being studied. May collect additional medical history such as previous operations, radiography, allergies (especially to iodine and seafood), respiratory problems or asthma. Asks female patient whether she thinks she may be pregnant. Answers patient's questions.

4. Performer considers whether there are contraindications to going ahead with the procedure. May have clinician called to discuss patient's current condition and further steps.

List Elements Fully

   a. Performer decides whether to proceed or not based on assessment of patient's current condition, scout film and/or evidence of allergy to contrast medium.
   b. If performer decides not to proceed, records reasons and any recommendations on patient's chart. Informs appropriate co-worker of cancellation and has patient returned to room. If appropriate, orders rescheduling of patient or scheduling for alternative procedure.

5. If performer decides to proceed, reviews decisions on technique for non-routine study. If routine request or repeat IVP and performer judges that type of IVP requested is not best for suspected condition, performer writes changes on requisition sheet.

   a. Performer indicates to appropriate co-worker that decision has been made to proceed with the test dose of the contrast medium (unless already done recently).
   b. Performer indicates to technologist whether IVP will be routine injection, infusion, or injection with minute sequence. Indicates site of injection or infusion.

6. If performer will administer test dose of contrast solution (to check reaction to iodine based medium):

   a. Performer has patient prepared and checks that procedure tray and emergency cart are present and properly equipped.
   b. Performer may prepare patient personally by exposing arm, applying tourniquet, finding vein, and swabbing site with antiseptic solution, or has this done.
   c. Performer asks for or selects prepared test dose of radiopaque solution in hypodermic. If using separate syringe for test dose, checks

TASK DESCRIPTION SHEET (continued)

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List Elements Fully

for proper amount (1 or 2cc); otherwise checks for amount needed for test and full doses. Expels air from syringe; inserts needle into vein; removes tourniquet and injects test dose. If using two syringes, removes needle and swabs site. If using one syringe, leaves in place.

d. Performer observes patient's reactions to test dose for several minutes to decide whether to proceed with full dosage of contrast solution for IVP.

7. If patient has a severe reaction to the test dose such as anaphylactic shock (exaggerated negative reaction to the foreign substance), bronchospasm (stricture of bronchial tubes), hypotension (drop in blood pressure), cyanosis (bluish discoloration due to excessive concentration of reduced hemoglobin in blood), or cardiac arrest, performer proceeds immediately with emergency life support procedures:

   a. Performer determines the nature of condition by listening for heartbeat, respiration; may check blood pressure; may take EKG reading, using equipment on emergency cart.
   b. Depending on the nature of the symptoms, performer may carry out any or all of the following, using equipment on emergency cart:

      i) May administer oxygen or air using oxygen tank and mask or ambu bag; may clear airway using finger or tongue blade.
      ii) May decide to establish an airway by removing any dentures and, using a laryngoscope (to view larynx), inserting endotracheal tube. May perform tracheostomy by cutting opening into trachea through neck for insertion of tube.

List Elements Fully

      iii) May apply closed chest cardiac massage.
      iv) Depending on EKG results may apply defibrillator by selecting watt seconds, applying, and raising watt seconds until effective.
      v) Depending on EKG results may administer a prepared intracardial injection of a heart stimulant.
      vi) May decide on and administer IV infusion.

   c. When patient has been revived, performer records reaction to test dose and what was done on patient's chart. Notifies appropriate medical staff; orders aftercare as appropriate; and has patient transported to appropriate location.
   d. Terminates procedure by notifying appropriate staff.

8. If performer judges that patient displays a strong (but not emergency) allergic reaction, performer decides whether or not to proceed with full dosage.

   a. If performer decides to terminate, performer records details of test on patient's chart and requisition form. Explains to patient that he or she is allergic to the contrast solution (i.e. iodine-based solution). Terminates procedure and notifies appropriate staff.
   b. If performer decides to proceed, performer may order medication to treat the reaction, such as atropine or an antihistamine. Records on patient's chart.

9. If performer decides to proceed with full dosage of the contrast solution, performer makes sure that materials are present for IV infusion or injection as decided.

TASK DESCRIPTION SHEET (continued)

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List Elements Fully

10. If performer is to proceed with intravenous injection of the contrast solution, performer injects full dosage (50cc) of radiopaque solution remaining in syringe, or uses second syringe as described above, checking proper amount before injecting.

11. If performer is to proceed with intravenous infusion of the contrast solution, checks prepared IV bottle containing full dosage (125cc) of radiopaque solution:

    a. Sets up IV infusion apparatus near patient. Attaches bottle of prepared contrast solution to sterile IV tubing. Hangs at appropriate height on pole near patient with clamp in closed position.
    b. Prepares patient for insertion of IV needle by exposing vein selected, applying tourniquet, and swabbing site with antiseptic solution. Inserts IV needle with sterile loop attached. Tapes needle into position. May immobilize limb.
    c. Runs fluid through tubing to check flow and remove air. Attaches loop of needle to IV tubing. Adjusts flow in tube to desired rate and starts infusion. Checks on patient while infusion is in process.

12. Performer observes patient for signs of severe reaction to the full dose of contrast solution. If there is a severe reaction, performer proceeds, as described above, with emergency care.

    If there are no serious adverse reactions, performer tells radiologic technologist when to go ahead with radiography, and specifies (for IV injection) whether routine or minute sequence is to be followed. Checks that patient is properly shielded.

List Elements Fully

    If performer has any orders for or decides on any non-routine views or variations in the procedure or patient positioning, indicates these to technologist. May write special requests on requisition sheet if not already entered.

13. Performer remains on call in case of delayed reaction during radiographic examination. If there is a delayed serious reaction, performer proceeds as described above, with emergency care.

14. Performer looks at each series of radiographs on view boxes as soon as they are processed:

    a. Determines whether the radiographs are technically adequate to demonstrate the area and condition under study and provide sufficient information to make possible a competent medical interpretation. Performer may ask opinion of clinician or another radiologist.
    b. Performer decides whether to order additional views or a change in the technical factors.
    c. Performer decides whether to order delayed radiographs when all the standard series have been reviewed, based on the information already available on the radiographs, the way in which the patient responded to the procedure, the patient's condition, and his or her cumulative exposure.

15. If the performer decides to order additional views, a change in the technical factors, or delayed radiographs, informs technologist what is needed; may record. Performer examines additional radiographs as described above.

TASK DESCRIPTION SHEET (continued)

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List Elements Fully	List Elements Fully
16. When performer has determined that the examination has been completed, removes IV apparatus (if appropriate) and/or informs subordinates to terminate the procedure. If appropriate, has appropriate sanitary clean up procedures carried out. 17. Records impressions of procedure on patient's chart: a. Preliminary findings. b. How patient tolerated procedure. c. Any special nursing follow-up recommended. d. May sign chart or requisition sheet.	

TASK DESCRIPTION SHEET

Task Code No. 313

This is page 1 of 3 for this task.

1. **What is the output of this task? (Be sure this is broad enough to be repeatable.)**

Decision on whether to go ahead with nephrotomography; "cuts" for tomograms specified (the depth, level and intervening distances); IV infusion of iodine based contrast solution set up; emergency care administered; complete set of nephrotomograms ordered and approved; medical impressions and recommendations recorded.

2. **What is used in performing this task? (Note if only certain items must be used. If there is choice, include everything or the kinds of things chosen among.)**

X-ray requisition form and patient's chart; nephrotomogram scout films; view boxes; prepared sterile tray with materials needed for IV infusion of iodine based contrast solution; materials and equipment on emergency cart; telephone; pen; shielding

3. **Is there a recipient, respondent or co-worker involved in the task?** Yes...(X) No...( )

4. **If "Yes" to q. 3: Name the kind of recipient, respondent or co-worker involved, with descriptions to indicate the relevant condition; include the kind with whom the performer is not allowed to deal if relevant to knowledge requirements or legal restrictions.**

Any patient to have nephrotomography;radiologist; clinician;nephrologist;radiologic technologist; nursing personnel;clerk; anesthesiologist

5. **Name the task so that the answers to questions 1-4 are reflected. Underline essential words.**

Directing nephrotomography of any patient by deciding whether to proceed; reassuring patient; reviewing preliminary films; selecting positions, levels, and distances of tomogram "cuts"; setting up IV infusion of contrast solution; ordering nephrotomography at appropriate time; deciding when examination is completed by viewing nephrotomograms; recording medical impressions and needed nursing follow-up.

List Elements Fully

Performer receives the x-ray requisition form and medical information on a patient scheduled for nephrotomography (radiographs of selected layers of the kidney).

1. Performer reads the patient's requisition form and relevant information to become familiar with the case or to review materials seen earlier.

   a. Notes patient's age and sex; reviews interpretation of IVP's taken prior to this examination to become familiar with location and nature of the kidney pathology suspected.
   b. Notes recommendations on number and depth of cuts for tomograms, comments by nephrologist,description of how patient tolerated previous injection of contrast medium, and any other medically relevant information. Performer may examine patient's pyelograms on view boxes.
   c. With pediatric patient notes whether general anesthesia has been suggested. Checks to see that patient or authorized adult has signed consent for procedure. If not, informs appropriate co-worker and either has examination delayed until written consent is obtained or arranges to obtain personally.

OK-RP;RR;RR

6. Check here if this is a master sheet..(X)

TASK DESCRIPTION SHEET (continued)

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This is page 2 of 3 for this task.

List Elements Fully

2. Performer greets patient and any accompanying adult in examination room. Attempts to reassure and explains what will be done. Performer may question patient or adult about symptoms. May palpate area to feel location of mass. Answers questions. Notes collateral conditions such as presence of infection or communicable disease. Determines whether female patient of childbearing age may be pregnant.

3. Performer notes whether there are contraindications to going ahead with the nephrotomography such as adverse reaction to prior use of contrast medium. May have clinician or nephrologist called; discusses patient's current condition and any alternative steps.

   Performer decides whether to proceed or not based on assessment of patient's current condition and any danger of a severe allergic reaction to the iodine based contrast solution.

4. If performer decides not to proceed, records reasons and any recommendations on patient's chart. Informs appropriate co-worker of cancellation and has patient returned to room. If appropriate, orders rescheduling of patient or scheduling for alternative procedure.

5. If performer decides to go ahead, performer orders scout films. Estimates the probable depth and level of the mass to be studied based on recommendations on requisition sheet and own examination. Indicates levels, amplitude (size of "slice"), positions, number of "cuts" to technologist. Makes sure that patient is properly shielded and immobilized. Orders contrast solution prepared, in amount based on patient's size.

   a. Performer views the scout nephrotomograms on view boxes as they are processed, until performer judges that the mass has been localized visually.

List Elements Fully

   b. Performer then selects the level, number and intervening distances at which the "cuts" should be made with the patient in supine and oblique positions, after introduction of the contrast solution.

6. With pediatric patient performer considers whether general anesthesia (if suggested) is still warranted; may decide to order if patient's behavior and condition suggest the need. If general anesthesia is to be carried out, performer discusses with anesthesiologist when it is to be performed and awaits indications from anesthesiologist as to when to proceed.

7. Performer proceeds with IV infusion of the contrast solution. Checks prepared IV bottle containing appropriate dosage of radiopaque solution:

   a. Sets up IV infusion apparatus near patient. Attaches bottle of prepared contrast solution to sterile IV tubing. Hangs at appropriate height on pole near patient with clamp in closed position.
   b. Prepares patient for insertion of IV needle by exposing vein selected, applying tourniquet, and swabbing site with antiseptic solution. Inserts IV needle with sterile loop attached. Removes tourniquet. Tapes needle into position. May immobilize limb.
   c. Runs fluid through tubing to check flow and remove air. Attaches loop of needle to IV tubing. Adjusts flow in tube to desired rate and starts infusion. Checks on patient while infusion is in process.

8. Performer observes patient's reaction to infusion for signs of adverse effects and stands by to provide emergency care if needed.

TASK DESCRIPTION SHEET (continued)

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This is page 3 of 3 for this task.

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9. Performer indicates to radiologic technologist when to take nephrotomograms, and checks final orders on positions, number, levels, and amplitudes for the first set of nephrotomograms.

10. Performer looks at set of nephrotomograms on view boxes as soon as they are processed. Determines whether the tomograms are technically adequate to demonstrate the area under study and provide adequate information on the nature and position of the pathology. Performer may ask opinion of another radiologist or nephrologist.

    a. Performer may decide that a level needs to be further defined. May decide on more cuts at shorter intervening distances for any given level and patient position. May decide to ask for a change in the technical factors to provide a more interpretable image.
    b. Performer decides what to order based on information already available, the way in which the patient responded to the procedure, and the patient's radiographic history.
    c. If the performer decides to order additional tomograms and/or a change in the technical factors, informs technologist, specifying what is needed; may record.

11. Performer examines additional nephrotomograms as described above. When performer has determined that the examination has been completed, removes the IV apparatus if appropriate. Informs technologist (and anesthesiologist if present) that the procedure may be terminated. Ensures that proper sanitary clean up procedures are carried out.

List Elements Fully

12. Records impressions of procedure on patient's chart:

    a. Preliminary findings.
    b. How patient tolerated procedure.
    c. Any special nursing follow-up recommended.
    d. May sign chart or requisition sheet.

TASK DESCRIPTION SHEET

Task Code No. 314

This is page 1 of 3 for this task.

1. **What is the output of this task?** (Be sure this is broad enough to be repeatable.)

Decision made on approval of non-neurologic computerized transverse axial tomography and/or additional studies; recommendations made on technique, prior preparation; record entered and placed for scheduling, expedited if so decided.

2. **What is used in performing this task?** (Note if only certain items must be used. If there is choice, include everything or the kinds of things chosen among.)

X-ray requisition form and patient's medical, clinical history; relevant radiographic materials and reports; telephone; view boxes; pen; dictation equipment

3. Is there a recipient, respondent or co-worker involved in the task? Yes...(X) No...( )

4. If "Yes" to q. 3: Name the kind of recipient, respondent or co-worker involved, with descriptions to indicate the relevant condition; include the kind with whom the performer is not allowed to deal if relevant to knowledge requirements or legal restrictions.

Referring physician; specialist; clerical personnel

5. **Name the task** so that the answers to questions 1-4 are reflected. Underline essential words.

Deciding whether to order non-neurologic computerized transverse axial tomography for any patient and/or alternative studies in consultation with referring physician, by reviewing scans and radiologic studies and clinical history, discussing, considering appropriateness of procedure; approving, refusing approval and/or recommending alternative studies; dictating reasons for refusal if requested; if approved, recommending technique for slices, use of contrast, prior preparation; recording orders and recommendations; placing for scheduling and/or typing; expediting if appropriate.

List Elements Fully

Performer decides whether to approve a request for non-neurologic computerized transverse axial tomography (depending on equipment available, cross section radiography scans at various levels of the body, based on differential radioabsorption of various types of normal and abnormal tissue and other substances) for any patient, submitted by a referring physician on an x-ray requisition form, by phone, or in person.

1. Performer reads the x-ray requisition form and the patient's history to learn the nature of the problem, the presenting symptoms, the suspected pathology, the clinical history, and area of interest. Notes whether request is urgent, whether need is for diagnosis or information prior to or subsequent to surgery or therapy.

    a. Performer notes the patient's age, sex, weight, height, the area of interest, referring physician, and the purpose of the scan, such as diagnosis, screening, pre-or post-therapeutic evaluation. Notes whether there is current emergency need for the procedure.

    b. Performer studies the relevant medical and clinical history, the recorded symptoms of the patient, the suspected nature and location of the pathology,

OK-RP;RR;RR

6. Check here if this is a master sheet..(X)

TASK DESCRIPTION SHEET (continued)

Task Code No. 314

This is page 2 of 3 for this task.

List Elements Fully

and relevant background information. If any prior radiography or clinical tests have been carried out, performer notes results. If any relevant prior radiographs, scans, radioisotope scans or ultrasonograms are available, performer studies these and their related reports to become more familiar with the nature of the current diagnostic information.

c. Performer notes any known sensitivity to iodine, prior response to contrast media or general history of allergy. Notes whether patient (if female) is pregnant. Notes whether patient has a communicable or infectious condition.

d. If the performer finds that the information provided is inadequate, performer arranges to have other materials sent or discusses needed information with relevant physician.

2. Depending on the type of equipment in use in institution and accumulated experience, performer evaluates whether examination is appropriate for the type and size of pathology suspected and the organ involved. May consider use of procedure in conjunction with other diagnostic procedures such as plain films, angiography, ultrasound, radioisotope scanning.

   a. Performer considers the appropriateness of the procedure for the purpose indicated and decides whether to recommend against request and/or recommend additional procedures.

   b. If performer recommends against a request, discusses with referring physician and writes reasons for refusal on requisition sheet, or destroys requisition if agreed to by referring physician.

List Elements Fully

i) If requested by physician, performer dictates a report on the decision, presenting his or her interpretation of any current radiographs, assessment of case, reason for refusal, and any other relevant comments.

ii) Returns materials on patient, and places dictated report to be picked up for typing.

3. If performer and physician agree on the requested and/or alternative studies, performer may decide to make recommendations on technique. May discuss with referring physician if appropriate.

   a. May suggest tissue density enhancement with IV injection or infusion of contrast, number and levels of planes of interest, angulation, and thickness of "slice" for the scans.

   b. Performer may decide whether to order routine study or special variations on normal routine procedures.

   c. Performer may consider whether sedation is required. If so, orders. May order prior preparation of patient such as food and/or liquid intake, cleansing enema, and/or cathartic and appropriate timing, based on the patient's age, the area of interest and suspected pathology. May order medication to reduce possible allergic reaction if contrast is to be injected.

   d. May order special procedures to prevent infection or contamination of the patient or environment.

   e. If a contrast agent will be injected, performer may arrange to have patient contacted to sign a consent for the procedure. If pa-

TASK DESCRIPTION SHEET (continued)

Task Code No. 314

This is page 3 of 3 for this task.

List Elements Fully	List Elements Fully
tient is a juvenile or is not legally competent, performer may arrange to have proper person contacted so that a consent for the procedure can be signed. f. Performer writes orders and recommendations on technique, anesthetic, and preparation procedures for patient on patient's chart or requisition form explicitly so that technologists and other personnel can be scheduled for work. g. Gives information to appropriate secretary for scheduling. Signs requisition sheet if appropriate. Performer considers the urgency of the need and, if appropriate, expedites scheduling personally by discussing with appropriate staff person(s).	

TASK DESCRIPTION SHEET

Task Code No. 315

This is page 1 of 4 for this task.

1. What is the output of this task? (Be sure this is broad enough to be repeatable.)

Decision made on whether to go ahead with procedure; pt. reassured; contrast solution and anesthetic injected; cyst puncture needle inserted; fluid removed and sample prepared for lab; decisions made on need for surgery, renography, sclerosing of cyst; air and contrast solution injected; sclerosing agent injected; orders given on radiography; completed radiographs approved; medical impressions and nursing follow-up recorded.

2. What is used in performing this task? (Note if only certain items must be used. If there is choice, include everything or the kinds of things chosen among.)

X-ray requisition form and pt.'s chart;related radiographic and ultrasonographic material;pen;prepared tray containing local anesthetic,contrast solution for IV injection,contrast solution for cyst,sterile syringes,needles,towels,empty syringe,antiseptic solution,swabs,tourniquet,sterile dressings,cyst puncture needle,tubing,sponge stick or towel clip;protective lead garments;sterile gown,gloves; fluoroscope; fluoroscope monitor;specimen container with preservative,labels;view boxes;emergency cart

3. Is there a recipient, respondent or co-worker involved in the task? Yes...(X) No...( )

4. If "Yes" to q. 3: Name the kind of recipient, respondent or co-worker involved, with descriptions to indicate the relevant condition; include the kind with whom the performer is not allowed to deal if relevant to knowledge requirements or legal restrictions.

Any patient to have renal cyst puncture;referring MD; radiologist;radiologic technologist;nursing personnel

5. Name the task so that the answers to questions 1-4 are reflected. Underline essential words.

Performing renal cyst puncture and conducting related radiography of any patient by deciding whether to go ahead;reassuring pt.;deciding on technique;injecting radiopaque solution;injecting anesthetic;inserting puncture needle using fluoroscopy;extracting cyst fluid;having sample prepared for lab;evaluating need for surgery and/or radiography,and/or sclerosing of cyst;injecting air and contrast solution into cyst cavity;injecting sclerosing agent;ordering radiography;deciding when examination is completed by viewing radiographs;recording medical impressions follow-up care.

List Elements Fully

Performer receives the x-ray requisition form and medical information on a patient scheduled for a renal cyst puncture (piercing of cavity of suspected cyst in kidney and removal of contents for examination), related radiography and/or possible treatment to contract the cyst.

1. Performer reads the patient's requisition form and relevant medical information to become familiar with the case or to review material seen earlier.

   Performer notes whether there is doubt if a mass is a cyst or a renal carcinoma;whether, if a cyst,sclerotic treatment has been requested (introduction of agent to harden and contract cyst),and whether there are requests for special radiographs.

   Performer reviews any materials such as IVP's,nephrotomograms or ultrasonograms to become familiar with exact location of the mass or cyst,its approximate size, and its shape. Examines radiographs on viewing box. Notes any recommendations on technique;notes how patient tolerated any previous procedures and any other medically relevant information such as presence of infectious or communicable condition, or possible pregnancy (if female).

2. Checks to see that patient has signed consent for procedure. If not, informs appropriate

OK-RP;RR;RR

6. Check here if this is a master sheet..(X)

TASK DESCRIPTION SHEET (continued)

Task Code No. 315

This is page 2 of 4 for this task.

List Elements Fully

List Elements Fully

co-worker and either terminates examination or has it delayed until written consent is obtained.

3. Performer greets patient in examination room. Attempts to reassure patient; explains what will be done. Answers questions. Ask female if she thinks she may be pregnant. Examines patient and notes relevant symptoms. May palpate area to be studied.

4. Performer notes whether there are contraindications to going ahead with the procedure. May have clinician or specialist called;discusses patient's current condition and any alternative steps.
    a. Performer decides whether to proceed or not based on evaluation of patient's condition.
    b. If performer decides not to proceed, records reasons and any recommendations on patient's chart. Informs appropriate co-worker of cancellation and has patient returned to room. If appropriate, orders rescheduling of patient or scheduling for alternative procedure.

5. If performer decides to proceed, makes final decisions on technique and site of entry based on requisition sheet, chart and own examination. If appropriate, writes decision on requisition sheet and informs appropriate co-workers so that patient, materials and technical factors for fluoroscopy can be prepared or set.

6. When informed that patient is ready, performer checks whether patient has been properly prepared and shielded. Performer indicates any needed adjustments. Reassures patient and does so as deemed needed throughout procedure. Explains that performer will ask the patient to hold still from time to time during procedure, and does so as appropriate.Checks staff shielding.

7. Performer checks that all materials needed for procedure are present. Requests any missing objects.

8. Performer may prepare patient for intravenous injection of contrast solution. Exposes arm; applies tourniquet; finds vein and swabs entry site with antiseptic solution.

    Performer asks for or selects prepared dose of radiopaque solution in hypodermic; checks for proper amount; expels air in syringe. Performer inserts needle into vein,removes tourniquet, and injects contrast solution. Removes needle and swabs site. Waits appropriate amount of time for contrast solution to reach the kidney.

9. If not already done, performer has needles and syringes needed in procedure prepared; may assemble the needle for cyst puncture. Dons protective lead garments and sterile gown and gloves.

10. After proper elapse of time,has patient prepared for cyst puncture. Cleanses site for puncture and injection of anesthetic by swabbing with prepared antiseptic solution. Covers surrounding areas with sterile towels, leaving only small area for injection and puncture uncovered.

11. Checks amount of local anesthetic to be injected as shown by nurse; draws anesthetic into sterile syringe. Aspirates; inserts needle, and injects anesthetic in site selected. Removes needle; swabs site with sterile solution. Waits for area to become anesthetized.

TASK DESCRIPTION SHEET (continued)

Task Code No. 315

This is page 3 of 4 for this task.

List Elements Fully

12. Performer positions fluoroscope unit over patient and has lights in room dimmed. Activates fluorosocpe or has this done by technologist. Performer adjusts unit until the cyst or mass and the kidney are visible on the TV monitor. May indicate needed adjustment in technical factors to technologist. May reposition patient.

13. When the technical quality of the TV image is judged adequate, performer uses a sponge stick or towel clip to clasp the hollow puncture needle and permit viewing of needle on monitor without exposing performer's hands to direct radiation.

14. Performer positions the needle over the suspected cyst by viewing location of needle and mass on the monitor.

    When the needle is in correct location, performer adjusts it to the proper angle for entry.

15. Performer asks patient to hold breath and inserts needle into site, negotiating the intervening space and feeling for "pop" which indicates that a cyst has been penetrated.

    If performer feels a gritty sensation, judges that a tumor may be present.

    If performer feels neither sensation, performer may readjust needle placement, checking on TV monitor, or withdraw and reinsert as deemed necessary until "pop" or gritty sensation is felt. Shuts off fluoroscope.

16. Performer immediately attaches a sterile rubber tube extension to the protruding end of the needle.

17. Performer attaches a sterile syringe to the rubber tube extension and attempts to draw out fluid.

List Elements Fully

a. If performer is unable to aspirate any fluid into syringe, may recheck position of needle and adjust as described above. May conclude that a cyst is not involved.

   Performer may decide to terminate procedure or have further renography performed. Removes needle and treats wound. Records decision on patient's requisition sheet and informs staff.

b. If performer obtains dark clotted blood, performer decides whether a tumor has been entered or whether the needle has passed through the pathological mass and entered the kidney. Performer rechecks needle position using fluoroscopy.

   If performer judges that the needle has entered the kidney, performer readjusts needle using fluoroscopy and again attempts to obtain fluid.

   If performer judges that the needle has penetrated a tumor, performer terminates procedure as described above; has ordering physician notified; may make arrangements to have patient sent for surgery; and records on patient's chart. Performer has specimen prepared for cytology lab as described below.

c. If performer obtains clear or slightly bloody fluid from cyst, aspirates approximately one third of performer's estimation of the cyst's capacity. Removes syringe and ejects fluid into sterile container containing preservative. Closes off needle. Has container capped, properly labeled, and sent to cytology lab for testing. Re-

TASK DESCRIPTION SHEET (continued)

Task Code No. 315

This is page 4 of 4 for this task.

List Elements Fully

cords amount and condition of any fluid withdrawn on patient's chart.

18. If performer has determined the presence of a cyst, performer prepares for radiography of the cyst.

    Performer opens needle and injects a selected contrast solution and air into cyst through tube attached to needle. (Uses a syringe filled with the appropriate amount of solution and an empty syringe to inject air in correct amount. This creates three layers: air, cyst fluid, and contrast solution, each having a different specific gravity.) Performer may check for effect by viewing on fluoroscope monitor.

19. If requested on requisition sheet, or if performer decides that a cyst is involved which should be contracted, performer decides to inject a sclerosing agent (an agent to harden and contract the cyst, thus shrinking it).

    Performer has sterile syringe prepared with the proper amount of a selected sclerosing agent. Checks amount. Injects through tube attached to needle. May view on fluoroscope monitor.

20. Performer reassures patient and has patient hold still while performer removes tubing and then gently removes the puncture needle. Swabs area. Decides on sterile dressing and orders or applies personally.

21. Performer decides what overhead radiographs to order to demonstrate the walls, shape and size of the cyst and to show up the presence of other pathological masses. Specifies to technologist what views to take. May record.

22. Performer looks at first series of radiographs on view boxes as soon as they are processed. Determines whether they are technically adequate to demonstrate the area under study and provide sufficient information to make possible a competant medical interpretation. Performer may ask opinion of clinician or another radiologist.

List Elements Fully

    a. Performer decides whether to order additional views or a change in technical factors based on the information already available, the patient's condition and his or her radiologic history.
    b. If the performer decides to order additional views and/or decides that any radiographs should be redone with a change in the technical factors, performer informs technologist, specifying what is needed. May record.
    c. Performer examines additional radiographs as above.

23. When performer has determined that the examination has been completed, informs subordinates to terminate the procedure. Ensures proper clean up.

24. Records impressions of procedure on patient's chart:

    a. Preliminary findings.
    b. How patient tolerated procedure.
    c. Any special nursing follow-up recommended.
    d. May sign chart or requisition sheet.

TASK DESCRIPTION SHEET

Task Code No. 316

This is page 1 of 2 for this task.

1. What is the output of this task? (Be sure this is broad enough to be repeatable.)

Biopsy needle placed in kidney in proper location and depth for biopsy; sample extracted.

2. What is used in performing this task? (Note if only certain items must be used. If there is choice, include everything or the kinds of things chosen among.)

X-ray requisition form, patient's radiographic materials; pen; biopsy needle; antiseptic solution, swabs; sponge stick or towel clip; protective lead garments; sterile gown and gloves; fluoroscope and fluoroscope monitor; container for biopsy sample; labels; view box; marking pencil

3. Is there a recipient, respondent or co-worker involved in the task? Yes...(X) No...( )

4. If "Yes" to q. 3: Name the kind of recipient, respondent or co-worker involved, with descriptions to indicate the relevant condition; include the kind with whom the performer is not allowed to deal if relevant to knowledge requirements or legal restrictions.

Any patient to have renal biopsy; nephrologist; radiologic technologist

5. Name the task so that the answers to questions 1-4 are reflected. Underline essential words.

Assisting in renal biopsy of any patient by using fluoroscopy to place biopsy needle, by reviewing radiographic materials; using fluoroscope to guide needle placement to correct chosen tissue location and depth of entry in kidney; recording if appropriate.

List Elements Fully

Performer receives the x-ray requisition form and medical information on a patient scheduled for a renal biopsy (removal of tissue or matter from kidney for purposes of diagnosis) when performer is scheduled to assist the nephrologist, or performer may be requested to assist in procedure by nephrologist.

1. Performer reviews any radiographic materials, such as IVP's,which present the condition of the kidney, to become familiar with the location of the suspected pathology. Uses view boxes. Performer may discuss with nephrologist.
2. Performer is informed that the patient is ready for insertion of the biopsy needle (after injection of anesthetic and its having taken effect). Dons protective lead garments and sterile gown. May talk to patient to explain what is being done and reassure. Checks shielding of patient and staff.
3. Performer positions overhead fluoroscope unit over the kidney. Positions patient so that the area from which the sample will be taken will be shown most effectively and permit entry of the biopsy needle.
    - a. Has lights in room dimmed. May indicate to technologist what technical factors to select and have fluoroscope activated.
    - b. Performer adjusts fluoroscope unit until the area from which the sample will

OK-RP;RR;RR

6. Check here if this is a master sheet..(X)

TASK DESCRIPTION SHEET (continued)

Task Code No. 316

This is page 2 of 2 for this task.

List Elements Fully

be taken is visible on the TV monitor. May indicate needed adjustments in technical factors to technologist. May adjust patient's position.

c. May explain what is visible on the monitor to the nephrologist, or discusses which exact area to select for the sample of tissue. Dons sterile gloves.

4. When the technical quality of the image is judged adequate, performer turns off fluoroscope. Marks the point of entry on the patient's back with a marking pencil. Turns on fluoroscope and may assist nephrologist in placing the biopsy needle directly on the marked target area. May instruct nephrologist in how to move needle into position by viewing monitor; or may grasp the needle with a sponge stick or towel clip and coordinate movements with image of needle and kidney tissue on screen.

5. Performer assists nephrologist or personally adjusts the angle of the needle for proper entry into kidney. Performer may take over from nephrologist at any point when necessary.

   Performer indicates to patient when to hold completely still so that needle can be inserted. Inserts needle or indicates to nephrologist to insert, negotiating the intervening space. Judges when the needle has been inserted at the proper depth to draw tissue from the area selected. May consult with nephrologist to be sure the correct spot has been reached.

   Performer repeats procedure until proper entry is accomplished. If heavy bleeding occurrs, performer may assist nephrologist to control bleeding.

List Elements Fully

6. Performer indicates to nephrologist when sample can be extracted and needle removed. Has fluoroscope turned off.

7. Performer may see that puncture is swabbed and dressed. May assist in labeling of sample. May sign requisition sheet.

TASK DESCRIPTION SHEET

Task Code No. 317

This is page 1 of 2 for this task.

1. What is the output of this task? (Be sure this is broad enough to be repeatable.)

Urographic material read, interpreted; conclusions drawn and recommendations made orally or dictated; physician called about emergency signs; selected radiographs earmarked for study or library use; material rejacketed, report placed for typing.

2. What is used in performing this task? (Note if only certain items must be used. If there is choice, include everything or the kinds of things chosen among.)

X-ray requisition forms; current radiographs, ultrasonograms; view boxes, prior radiographic materials; telephone, dictation equipment; pen; magnifying glass

3. Is there a recipient, respondent or co-worker involved in the task? Yes...(X) No...( )

4. If "Yes" to q. 3: Name the kind of recipient, respondent or co-worker involved, with descriptions to indicate the relevant condition; include the kind with whom the performer is not allowed to deal if relevant to knowledge requirements or legal restrictions.

Co-workers; urologist; nephrologist; ordering physician

5. Name the task so that the answers to questions 1-4 are reflected. Underline essential words.

Reading, interpreting and making recommendations on urographic materials, or giving opinions to co-workers by reviewing medical information and requisition sheet(s); evaluating new and old films; notifying ordering physician of emergency signs; explaining opinions or dictating findings and recommendations; placing report for typing.

List Elements Fully

Performer reads and interprets completed radiographs of urographic examinations, or provides opinions to co-workers, urologists and/or nephrologists, when requested, on interpretation and conclusions regarding radiographs or ultrasonographs involved in the urographic procedures they are doing.

1. If responding to request, performer goes to where radiographic material is on view. Listens while co-worker explains problem on how to proceed next or problem of interpretation.

   If reading and interpreting own completed work, performer obtains the jacketed radiographic work-ups. Includes the current set of radiographs, ultrasonograms, tomograms, their requisition sheets, and prior films if available. Goes to reading area.

2. Asks about, reads, or reviews x-ray requisition forms and materials on patient's medical history (reason for request, decisions made on technique, comments from ordering physician or consulting physicians, notes made during the procedure and interpretations made of procedures already completed).

   If reading and interpreting own work, places relevant radiographs on view box, including older films. If responding to request, may ask to see earlier films.

OK-RP;RR;RR

6. Check here if this is a master sheet..(X)

TASK DESCRIPTION SHEET (continued)

Task Code No. 317

This is page 2 of 2 for this task.

List Elements Fully

3. Performer reads and interprets the radiographic materials:
   a. Decides whether any abnormalities, changes, or suspicious signs warrant the immediate attention of the patient's physician. If so, telephones physician at once and discusses findings (or recommends that co-worker in charge of case do this).
   b. For own work, decides what to report and what recommendations to make.
   c. In response to request, decides what to recommend to co-worker. Explains interpretation and recommendations verbally, indicating how conclusions were arrived at, including medical and technical considerations.

4. Performer dictates findings (for own work) by explaining what appears on the films. Describes worrisome or suspicious signs, obvious abnormalities and/or changes over time, referring to earlier films. (Might indicate presence of artifacts which do not have medical significance).

   Indicates what implications can be drawn from findings and what conclusions and/or courses of action are warranted, including need for additional studies, tests, or courses of treatment.

   Dictates report in the style: There is ...on.... It has the characteristics of.... I believe that this indicates.... This could mean that.... It is necessary to determine whether.... This can be done by....

5. May decide whether any of the material is unusual or of special interest and warrants inclusion in museum library, or should be used for study purposes. Marks jackets appropriately if so decided.

List Elements Fully

6. Returns own patient's radiographic material, requisition sheet and tape of dictation to proper jacket, and places to be picked up for typing.

TASK DESCRIPTION SHEET

Task Code No. 318

This is page 1 of 2 for this task.

1. What is the output of this task? (Be sure this is broad enough to be repeatable.)

Radiology resident shown and explained urographic procedures; resident evaluated for readiness to do activities under supervision; resident observed and criticized; resident evaluated for readiness to do tasks without direct supervision; resident's work spot checked and criticized; questions answered; opinions on work given as requested; evaluation noted informally.

2. What is used in performing this task? (Note if only certain items must be used. If there is choice, include everything or the kinds of things chosen among.)

X-ray requisition forms; materials and equipment needed for procedures in urography; related radiographs and ultrasonographs; emergency equipment; view boxes

3. Is there a recipient, respondent or co-worker involved in the task? Yes...(X) No...( )

4. If "Yes" to q. 3: Name the kind of recipient, respondent or co-worker involved, with descriptions to indicate the relevant condition; include the kind with whom the performer is not allowed to deal if relevant to knowledge requirements or legal restrictions.

Radiology resident to be instructed in urographic procedures; any patient involved; urologists, nephrologists; supervisor of resident

5. Name the task so that the answers to questions 1-4 are reflected. Underline essential words.

Providing clinical training for radiology residents in urographic procedures by demonstrating procedures, explaining what is being done, answering questions; deciding when residents can perform tasks under direct supervision; observing and correcting; deciding when tasks can be done without direct supervision; spot checking and correcting; advising as requested or as deemed necessary.

List Elements Fully

Performer provides clinical training to residents in radiology in the area of urography, covering choice of urographic examinations such as intravenous pyelograms, nephrotomograms, ultrasound scanning, renal venograms, renal vein renin studies, renal cyst puncture, renal biopsy, medical aspects of procedures, interpretation of radiographic material, and possible recommendations and treatments.

1. Performer provides demonstration, explanation, informal evaluation and supervision in: reading requests for urographic procedures and deciding on best procedure; what to look for; available medical and technical procedures including types of examinations, anesthetics, surgical entry, use of contrast media, technical equipment, positions and angles, contraindications; providing technical and medical interpretation of radiographic materials; learning range of medical conclusions that can be drawn, additional tests, and courses of treatment to consider.

2. When performer is assigned a resident, may select times, patients, and procedures to demonstrate, and may explain to resident while performer carries out own tasks:

   a. Performer explains what will be taught.
   b. Performer may narrate the steps, may explain what is

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6. Check here if this is a master sheet..(X)

TASK DESCRIPTION SHEET (continued)

Task Code No. 318

This is page 2 of 2 for this task.

List Elements Fully

being done, or may explain the basis for decisions and actions.

c. Performer may decide to solicit questions to find out what the resident understands, may answer questions, or may elaborate on the explanation of what is being done, concentrating on the relevant skills and knowledges.
d. Performer decides when the resident has observed sufficiently and has a clear enough understanding of a procedure to carry it out under close, direct supervision and/or to assist.

3. Performer supervises and observes resident carrying out activities assigned.

   a. Performer asks the resident to do all or part of a procedure and remains at the side of the patient or carries out own portion and watches the resident perform the assigned activity.
   b. While observing, performer decides whether the activity is being done properly, whether there is a specific problem, whether there is need to demonstrate the procedure again or explain, and does so.
   c. Performer may comment on the performance, encourage or correct as deemed necessary, or do this later.
   d. Performer may decide to intervene and take over the procedure, explaining to the resident what was done incorrectly at that point or later.
   e. If decision is to demonstrate again, performer may redo and have the resident observe, or have resident repeat the procedure until it is done properly.
   f. Performer decides which procedures or activities can be done by the resident without direct supervision (although radiologist remains responsible). Informs proper supervisors; notes for own use, and/or tells this to resident.

List Elements Fully

4. Performer spot checks resident carrying out activities without direct supervision or responds to requests for guidance, assistance or further instruction.

   Performer proceeds as in steps 2 or 3 as appropriate, observing, noting areas needing improvement, determining nature of problem, assisting, giving opinions, answering questions, and providing further instruction on how to deal with unusual circumstances. Reinforces correct work. Suggests areas for improvement.

5. When patients are present for demonstrations, performer may explain presence of resident; when observing, performer may explain own presence.

6. Performer informally notes the extent of learning or proficiency of resident throughout the training:

   a. May decide to discuss performance with resident at any time.
   b. Does not keep formal records on what was taught, or on resident's progress.
   c. May make personal notes for use in later evaluation meetings.

TASK DESCRIPTION SHEET

Task Code No. 320

This is page 1 of 2 for this task.

1. What is the output of this task? (Be sure this is broad enough to be repeatable.)

Outline and content for lecture to medical students prepared; instructional materials collected, researched or prepared; lecture given.

2. What is used in performing this task? (Note if only certain items must be used. If there is choice, include everything or the kinds of things chosen among.)

Paper, pen; instructional and reading material in radiology; slides of radiographic materials; projector

3. Is there a recipient, respondent or co-worker involved in the task? Yes...(X) No...( )

4. If "Yes" to q. 3: Name the kind of recipient, respondent or co-worker involved, with descriptions to indicate the relevant condition; include the kind with whom the performer is not allowed to deal if relevant to knowledge requirements or legal restrictions.

Medical students; person in charge of medical student program; resident; library and/or clerical personnel

5. Name the task so that the answers to questions 1-4 are reflected. Underline essential words.

Planning and presenting lectures on assigned aspects of radiology for medical students by deciding on content, method of presentation; preparing material; presenting lecture, being aware of responses, and adjusting presentation to students' needs.

List Elements Fully

Performer presents lecture(s) on assigned aspect(s) of radiology to classes of medical students or others who wish to attend.

1. Performer is notified of assignment or decides what should be covered, and at what depth and degree of detail, considering the students' current academic level and curriculum objectives of medical school. May request change of time or topic and discusses with program director.

2. Decides on method of presentation and plans lecture:

   a. Prepares outline.
   b. May obtain special instructional materials or asks co-worker to obtain and reviews. May use materials already prepared.
   c. May do research in topic area for use in lecture.
   d. May prepare slides from own source of radiographs or may obtain existing slides.
   e. Performer may choose materials to contrast normal and pathological states.
   f. Decides on time to allocate for questions and answers.
   g. May have resident select materials; if so, reviews.

3. Presents lecture as deemed appropriate. Attempts to note whether information is being understood and adjusts pre-

OK-RP;RR;RR

6. Check here if this is a master sheet..(X)

TASK DESCRIPTION SHEET (continued)

Task Code No. 320

This is page 2 of 2 for this task.

List Elements Fully	List Elements Fully
sentation accordingly. Uses instructional material, answers questions, depending on plans. Leads discussions. May recommend additional reading. 4. May make note of any outstanding students and may report this to person in charge of medical student program. May keep materials and notes prepared for future use. Note: Does not submit outline or materials for review. Does not formally test students' learning. This may be open to question in terms of instructional effectiveness.	

TASK DESCRIPTION SHEET

Task Code No. 321

This is page 1 of 1 for this task.

1. What is the output of this task? (Be sure this is broad enough to be repeatable.)

Opinions given on clinical achievement of residents under supervision; consensus opinion reached on overall performance and grade to be given to each resident; notes taken on decisions.

2. What is used in performing this task? (Note if only certain items must be used. If there is choice, include everything or the kinds of things chosen among.)

Personal notes on residents; pen; paper

3. Is there a recipient, respondent or co-worker involved in the task? Yes...(X) No...( )

4. If "Yes" to q. 3: Name the kind of recipient, respondent or co-worker involved, with descriptions to indicate the relevant condition; include the kind with whom the performer is not allowed to deal if relevant to knowledge requirements or legal restrictions.

Co-worker radiologists; confidential secretary

5. Name the task so that the answers to questions 1-4 are reflected. Underline essential words.

Participating in radiologists meeting to arrive at overall clinical and academic assessments of residents in radiology by contributing personal opinions based on supervisory, counseling, and teaching experience with residents; participating in discussions and decisions on overall assessments and grade for each resident.

List Elements Fully

Performer is required to meet periodically with other radiologists to discuss and evaluate the progress of residents in radiology.

1. Performer may review and/or take to meeting any personal notes made on residents under performer's clinical, counseling, or classroom supervision.

2. As discussions develop on each resident, performer:

   a. Gives personal opinions about educational and clinical functioning of residents under performer's supervision, based on own experience and assessment.
   b. Participates in general discussions required to reach consensus regarding assessments of each resident, including assignment of a general grade for each. May participate in deciding on recommendations to be made to resident(s) on problem areas.

3. If requested, performer takes notes on the decisions arrived at and gives to typist.

OK-RP;RR;RR

6. Check here if this is a master sheet..(X)

TASK DESCRIPTION SHEET

Task Code No. 322

This is page 1 of 2 for this task.

1. What is the output of this task? (Be sure this is broad enough to be repeatable.)

Selected books and publications ordered, assigned code numbers; radiographic materials reviewed, decision made on entry to library, assignment of code numbers; code assignments reviewed; errors indicated to staff.

2. What is used in performing this task? (Note if only certain items must be used. If there is choice, include everything or the kinds of things chosen among.)

Advance announcements and reviews of books, journal articles and publications on diagnostic radiology and related fields; co-worker requests for documents; books and journals received; radiographic materials and descriptive comments; catalogue cards; coding-catalouging index; pen; order slips

3. Is there a recipient, respondent or co-worker involved in the task? Yes...(X) No...( )

4. If "Yes" to q. 3: Name the kind of recipient, respondent or co-worker involved, with descriptions to indicate the relevant condition; include the kind with whom the performer is not allowed to deal if relevant to knowledge requirements or legal restrictions.

Library staff

5. Name the task so that the answers to questions 1-4 are reflected. Underline essential words.

Deciding on diagnostic radiology library acquisitions of books, journals and radiographic materials, by reviewing advance notices and submissions; coding library acquisitions using Anatomic-Pathological Code System.

List Elements Fully

Performer supervises the entry of new materials into the library of diagnostic radiology department. Performer reviews and selects books and journals, and evaluates the radiographic materials submitted for possible inclusion by co-workers.

1. Performer selects books and journal publications for entry.
    a. Receives and reviews advance notices, reviews in publications already received, and requests made by co-workers for specific books, articles in journals, and/or subscriptions to journals.
    b. Performer orders material considered to be relevant and/or requested by co-workers. May have library staff check whether any of the material is already on hand.
2. Performer selects radiographic materials for library use.
    a. Receives and reviews material submitted by co-workers for teaching purposes or as illustration of special interest to the field.
    b. Considers whether material is appropriate for use and/or is duplication of similar material already on hand. Performer may decide to substitute new material for older items already in library.

OK-RP;RR;RR

6. Check here if this is a master sheet..(X)

TASK DESCRIPTION SHEET (continued)

Task Code No. 322

This is page 2 of 2 for this task.

List Elements Fully	List Elements Fully
3. Performer may assign catalogue categories and code numbers to material, or may review or spot check catalogue and code assignments made by library staff on index cards. Uses the Anatomic-Pathological Code System endorsed by the American College of Radiologists, which designates anatomical part and pathology by number. If performer notes errors in code assignments, brings this to attention of library staff.	

TASK DESCRIPTION SHEET

Task Code No. 323

This is page 1 of 2 for this task.

1. What is the output of this task? (Be sure this is broad enough to be repeatable.)

Presentation prepared and made in urography and radiology developments or case studies; presentations of urologists, nephrologists or radiologists listened to; discussions participated in.

2. What is used in performing this task? (Note if only certain items must be used. If there is choice, include everything or the kinds of things chosen among.)

Radiolographic and medical equipment; radiographic materials; case histories; view boxes, slide projectors

3. Is there a recipient, respondent or co-worker involved in the task? Yes...(X) No...( )

4. If "Yes" to q. 3: Name the kind of recipient, respondent or co-worker involved, with descriptions to indicate the relevant condition; include the kind with whom the performer is not allowed to deal if relevant to knowledge requirements or legal restrictions.

Urologists; nephrologists; radiologists;resident

5. Name the task so that the answers to questions 1-4 are reflected. Underline essential words.

Participating in meetings of radiologists, urologists and nephrologists to discuss new developments, cases of interest, and case problems in the fields of urology and urography by planning and presenting new developments in the urographic or radiologic field, interesting case studies, or problems in current cases, and/or by deciding to listen to presentations about new developments in urology, interesting case studies, or case problems, and participating in discussions; contributing from own knowledge and experience in the field.

List Elements Fully

Performer attends meetings of medical staff and co-workers in urology and urography to discuss areas of mutual concern.

1. Performer may prepare presentations describing new work in the field of urography or general radiology.
   - a. Performer decides what to present and in what degree of depth and detail.
   - b. Decides how to make presentation and what to use.
   - c. May prepare outline, obtain special instructional materials, do research on topic for use in presentation. May have resident assist.
   - d. May prepare slides from own source of radiographs or may obtain existing radiographic material and slides from library. May have resident assist.
   - e. At meeting, when performer is called upon, places radiographs, spot films or other radiographic materials on view box or uses slide projector. Describes work selected, answers questions, and participates in discussion. May recommend further reading.
   - f. Performer, may, when appropriate, demonstrate or simulate new and/or relevant techniques, equipment or procedures.

OK-RP;RR;RR

6. Check here if this is a master sheet..(X)

TASK DESCRIPTION SHEET (continued)

Task Code No. 323

This is page 2 of 2 for this task.

List Elements Fully

g. Performer replaces materials and equipment or has this done.

2. Performer may attend conferences at which urologists and/or nephrologists present case studies and raise the problems involved, or performer may choose a case which is of educational interest from the library or personal files.

   a. Performer may be told beforehand by department head or conference leader what current or past cases will be presented for discussion, or performer will discuss the type of information to be covered in order to select a relevant case.
   b. Performer obtains the radiographic materials related to the cases selected or selects appropriate case. May have assistant gather materials and reviews to be sure they are appropriate.
   c. Performer reviews the radiographs and the requisition sheets involved, and any other relevant medical information such as reports and interpretations already made.
   d. Performer may make notes to use as reference, pointing out fine points with regard to interpretation of the radiographs in connection with pathological symptoms and conditions.
   e. At the conference, performer presents the radiographs involved as appropriate; presents interpretation and makes relevant points so as to instruct the audience in the reasoning involved. Participates in the discussion, answers questions. May suggest reference articles on subject.
   f. Performer replaces radiographic materials or has these replaced.

List Elements Fully

   g. If current case studies are involved performer may maintain files on the case(s) and read reports including final diagnosis and treatment prescriptions.

3. Performer may decide to attend presentation by urologist, nephrologist or co-worker. May make notes, ask questions and/or participate in discussion.

4. Performer may decide to attend presentation by urologist, nephrologist or co-worker about a particular case that is of interest. May make notes, ask questions and/or participate in discussion.

5. Performer may decide to present problems in urology and/or nephrology that performer is personally having trouble with and ask for comments and suggestions from participants.

   a. Selects the case material needed to present the problem.
   b. Makes presentation and poses problems involved.
   c. Listens and participates in resulting discussions.

TASK DESCRIPTION SHEET

Task Code No. 324

This is page 1 of 2 for this task.

1. What is the output of this task? (Be sure this is broad enough to be repeatable.)

Presentation prepared and made in arthritis and radiology developments or case studies;presentations of specialists in arthritis listened to;discussions participated in.

2. What is used in performing this task? (Note if only certain items must be used. If there is choice, include everything or the kinds of things chosen among.)

Radiographic and medical equipment; radiographic materials; case histories; view boxes, slide projectors

3. Is there a recipient, respondent or co-worker involved in the task? Yes...(x) No...( )

4. If "Yes" to q. 3: Name the kind of recipient, respondent or co-worker involved, with descriptions to indicate the relevant condition; include the kind with whom the performer is not allowed to deal if relevant to knowledge requirements or legal restrictions.

Orthopedists and MD specialists in arthritis; radiologists

5. Name the task so that the answers to questions 1-4 are reflected. Underline essential words.

Participating in meetings of physicians involved with arthritis to discuss new developments,cases of interest and case problems in the field by planning and presenting new developments in the fields of arthritis or radiology, interesting case studies, problems in current cases and/or by deciding to listen to presentations about new developments, interesting case studies or case problems, and participating in discussions.

List Elements Fully

Performer attends meetings of medical staff and co-workers to discuss areas related to arthritis work.

1. Performer may prepare presentations describing new work in the field of arthritis or general radiology.
    - a. Performer decides what to present and in what degree of depth and detail.
    - b. Decides on how to make presentation and what to use.
    - c. May prepare outline, obtain special instructional materials, do research on topic for use in presentation. May have resident assist.
    - d. May prepare slides from own source of radiographs or may obtain existing radiographic material and slides from library. May have resident assist.
    - e. At meeting, when performer is called upon, places radiographs, spot films or other radiographic materials on view box or uses slide projector. Describes work selected, answers questions and participates in discussion. May recommend further reading.
    - f. Performer,may, when appropriate, demonstrate or simulate new and/or relevant techniques,equipment or procedures.
    - g. Performer replaces materials and equipment or has this done.

OK-RP:RR:RR

6. Check here if this is a master sheet..(x)

TASK DESCRIPTION SHEET (continued)

Task Code No. 324

This is page 2 of 2 for this task.

List Elements Fully

2. Performer may attend conferences at which orthopedists and other specialists present case studies and raise the problems involved, or performer may choose a case which is of interest from the library or personal files which is of educational interest.

   a. Performer may be told beforehand by department head or conference leader what current or past cases will be presented for discussion, or performer will discuss the type of information to be covered in order to select a relevant case.
   b. Performer obtains the radiographic materials related to the cases selected or selects appropriate case. May have assistant gather materials and reviews to be sure they are appropriate.
   c. Performer reviews the radiographs and the requisition sheets involved, and any other relevant medical information such as reports and interpretations already made.
   d. Performer may make notes to use as reference, pointing out fine points with regard to interpretation of the radiographs in connection with pathological symptoms and conditions.
   e. At the conference performer presents the radiographs involved as appropriate; presents interpretation and makes relevant points so as to instruct the audience in the reasoning involved. Participates in the discussion, answers questions. May suggest reference articles on subject.
   f. Performer replaces radiographic materials or has these replaced.
   g. If current case studies are involved, performer may maintain files on the case(s) and read reports including final diagnosis and treatment prescriptions.

List Elements Fully

3. Performer may decide to attend presentation by specialists in arthritis. May make notes, ask questions and/or participate in discussion.

4. Performer may decide to attend presentation about a particular case that is of interest. May make notes, ask questions and/or participate in discussion.

TASK DESCRIPTION SHEET

Task Code No. 325

This is page 1 of 2 for this task.

1. What is the output of this task? (Be sure this is broad enough to be repeatable.)

Presentation prepared and made on radiology developments or case studies; presentations of surgeons, pathologists or radiologists listened to; discussions participated in.

2. What is used in performing this task? (Note if only certain items must be used. If there is choice, include everything or the kinds of things chosen among.)

Radiographic and medical equipment; radiographic materials; case histories; view boxes, slide projectors

3. Is there a recipient, respondent or co-worker involved in the task? Yes...(X) No...( )

4. If "Yes" to q. 3: Name the kind of recipient, respondent or co-worker involved, with descriptions to indicate the relevant condition; include the kind with whom the performer is not allowed to deal if relevant to knowledge requirements or legal restrictions.

Surgeons; pathologists; radiologists

5. Name the task so that the answers to questions 1-4 are reflected. Underline essential words.

Participating in meetings of radiologists, surgeons and pathologists to discuss new developments, cases of interest and case problems in the fields of surgery and radiology by planning and presenting new developments in the radiologic field, interesting case studies or problems in current cases and/or by deciding to listen to presentations about new developments in surgery, interesting case studies or case problems, and participating in discussions.

List Elements Fully

Performer attends meetings of medical staff and co-workers in surgery and pathology to discuss areas of mutual concern.

1. Performer may prepare presentations describing new work in the field of general radiology.
   - a. Performer decides what to present and in what degree of depth and detail.
   - b. Decides on how to make presentation and what to use.
   - c. May prepare outline, obtain special instructional materials, do research on topic for use in presentation. May have resident assist.
   - d. May prepare slides from own source of radiographs or may obtain existing radiographic material and slides from library. May have subordinate assist.
   - e. At meeting, when performer is called upon, places radiographs, spot films or other radiographic materials on view box or uses slide projector. Describes work selected, answers questions, and participates in discussion. May recommend further reading.
   - f. Performer, may, when appropriate, demonstrate or simulate new and/or relevant techniques, equipment or procedures.

OK-RP;RR;RR

6. Check here if this is a master sheet..(X)

TASK DESCRIPTION SHEET (continued)

Task Code No. 325

This is page 2 of 2 for this task.

List Elements Fully

g. Performer replaces materials and equipment or has this done.

2. Performer may attend conferences at which surgeons and/or pathologists present case studies and raise the problems involved, or performer may choose a case which is of interest from the library or personal files which is of educational interest.

   a. Performer may be told beforehand by department head or conference leader what current or past cases will be presented for discussion, or performer will discuss the type of information to be covered in order to select a relevant case.
   b. Performer obtains the radiographic materials related to the cases selected or selects appropriate case. May have assistant gather materials and reviews to be sure they are appropriate.
   c. Performer reviews the radiographs and the requisition sheets involved, and any other relevant medical information such as reports and interpretations already made.
   d. Performer may make notes to use as reference, pointing out fine points with regard to interpretation of the radiographs in connection with pathological symptoms and conditions.
   e. At the conference, performer presents the radiographs involved as appropriate and presents interpretation; makes relevant points so as to instruct the audience in the reasoning involved. Participates in the discussion, answers questions. May suggest reference articles on subject.
   f. Performer replaces radiographic materials or has these replaced.

List Elements Fully

g. If current case studies are involved, performer may maintain files on the case(s) and read reports including final diagnosis and treatment prescriptions.

3. Performer may decide to attend presentation by surgeons, pathologists or co-workers. May make notes, ask questions and/or participate in discussion.

4. Performer may decide to attend presentation about a particular case that is of interest. May make notes, ask questions and/or participate in discussion.

5. Performer may decide to present relevant problems that performer is personally having trouble with and ask for comments and suggestions from participants.

   a. Selects the case material needed to present the problem.
   b. Makes presentation and poses problems involved.
   c. Listens and participates in resulting discussions.

TASK DESCRIPTION SHEET

Task Code No. 326

This is page 1 of 2 for this task.

1. What is the output of this task? (Be sure this is broad enough to be repeatable.)

Issues for departmental meeting noted and/or raised; research report presented; discussion on departmental or professional matters participated in; votes cast on resolutions; appropriate information arranged to be transmitted or taught to staff.

2. What is used in performing this task? (Note if only certain items must be used. If there is choice, include everything or the kinds of things chosen among.)

Pen; paper; personal notes; research results, report

3. Is there a recipient, respondent or co-worker involved in the task? Yes...(X) No...( )

4. If "Yes" to q. 3: Name the kind of recipient, respondent or co-worker involved, with descriptions to indicate the relevant condition; include the kind with whom the performer is not allowed to deal if relevant to knowledge requirements or legal restrictions.

Professional staff members in diagnostic radiology;invited guests;supervisory staff

5. Name the task so that the answers to questions 1-4 are reflected. Underline essential words.

Participating in diagnostic radiology departmental meeting by raising issues dealing with staff functioning, procedures, equipment and supplies, and/or professional information; presenting report on research; participating in discussions and helping to arrive at resolutions by discussing issues and voting; arranging for transmission of decisions to staff and/or incorporating into instruction for staff as appropriate.

List Elements Fully

The performer attends regular or special staff meetings to discuss departmental functioning and/or developments in the field of diagnostic radiology that may be relevant.

1. During intervening periods between meetings performer may mentally note problems or information which performer wishes to raise, or may make notations about these. Performer may request special meeting to make a presentation of research findings. Performer may be requested to report results of research and/or recommendations to departmental meeting.

2. Performer may receive agenda of meeting indicating subjects to be discussed:
   a. Problems of staff functioning,such as work allocation, support staff, adequacy of performance, disciplinary problems.
   b. Administrative procedures that are to be instituted, evaluated,or changed.
   c. Problems with equipment or supplies needed, desired, to be considered for purchase.
   d. Professional information such as new findings, relevant literature, new techniques or equipment, information from classes, meetings,or conferences attended by performer.

OK-RP;RR;RR

6. Check here if this is a master sheet..(X)

TASK DESCRIPTION SHEET (continued)

Task Code No. 326

This is page 2 of 2 for this task.

List Elements Fully

List Elements Fully

   e. New examination procedures, changes in technique affecting diagnostic quality of the radiographic images, patient safety, reduction of exposure to ionizing radiation, improvement of accuracy of diagnostic conclusions, cost reduction, efficiency improvement, simplification of procedures.
   f. Problems of specific patients.

3. If performer is to present a report on research, organizes research materials, and results beforehand:

   a. Decides on what to present and how, based on the nature of the research.
   b. Decides whether to read report already prepared or present oral report based on findings. May develop an outline if not already done.
   c. Prepares audiovisual materials as appropriate.
   d. At the time of presentation performer addresses meeting, makes presentation, and offers any recommendations. Participates in discussion on issues; answers questions.

4. In attending meeting performer raises issues and/or participates in discussions raised by others. May take notes as desired.

5. Participates in coming to agreements on resolutions requiring action, such as deciding on use of instruments, catheters, contrast agents; proper standards for shielding, positioning, technique in particular examinations; inclusion or exclusion of specific types of radiographic or fluoroscopic examinations; use of various types of medications; use of new equipment; purchase of equipment; standardization of steps in new procedures; recommendations for further research; courses of action for specific patients; administrative decisions. Votes if appropriate.

6. Arranges if appropriate to have decisions transmitted to relevant staff. May decide to incorporate results of meeting into own clinical training practices. May arrange to have training provided to staff.

TASK DESCRIPTION SHEET

Task Code No. 328

This is page 1 of 2 for this task.

1. What is the output of this task? (Be sure this is broad enough to be repeatable.)

Decision made on whether to order lymphangiography and/or alternative study; recommendations made on technique; record entered and placed for scheduling.

2. What is used in performing this task? (Note if only certain items must be used. If there is choice, include everything or the kinds of things chosen among.)

X-ray requisition form and patient's chart; relevant radiographic materials; telephone; view boxes

3. Is there a recipient, respondent or co-worker involved in the task? Yes...(X) No...( )

4. If "Yes" to q. 3: Name the kind of recipient, respondent or co-worker involved, with descriptions to indicate the relevant condition; include the kind with whom the performer is not allowed to deal if relevant to knowledge requirements or legal restrictions.

Physician requesting lymphangiography; clinician; secretary or clerk

5. Name the task so that the answers to questions 1-4 are reflected. Underline essential words.

Deciding whether to order lymphangiography of any patient or alternative studies and recommending technique, in consultation with referring physician, by reviewing case history and relevant materials; discussing, recommending studies to be done and technique; recording; arranging for scheduling.

List Elements Fully

Performer decides whether to schedule lymphangiography (and/or lymphadenography): radiographic evaluation of lymphatic vessels (and/or nodes), and/or alternative studies upon receiving an x-ray requisition form or a request by phone or in person from a referring physician. Request may be for use in initial diagnosis or after an earlier procedure has uncovered a suspected pathological condition.

1. Performer reads the x-ray requisition form and the patient's history to learn the nature of the problem and the reason for the request.
   a. If the condition or the nature of the request warrants, performer discusses request with patient's attending physician.
   b. Performer studies any radiographic materials resulting from procedures already carried out, current, or on file, and/or interpretations already available relating to the radiographs. (Performer views radiographs on view boxes.)
   c. Performer notes whether patient has a communicable or infectious condition; notes radiographic history; if female, notes whether patient is pregnant.
   d. If the performer finds that the information provided is inadequate, performer arranges to have other materials sent or discusses with relevant physician.

OK-RP;RR;RR

6. Check here if this is a master sheet..(X)

TASK DESCRIPTION SHEET (continued)

Task Code No. 328

This is page 2 of 2 for this task.

List Elements Fully	List Elements Fully
e. Performer decides whether there are contraindications to the procedure requested such as adverse reactions to prior studies or allergies, and considers these in relation to the request.	
2. Performer decides whether to approve request, order additional or alternative studies, reorder earlier studies, or recommend no radiography, based on the information obtained.	
3. If performer recommends against all radiography, discusses with ordering physician and writes reasons on patient's chart.	
4. If performer and physician agree on initial request or on additional or alternative studies, performer writes what was decided on the patient's chart.	
5. If radiography is to be ordered, performer decides on what type of study to recommend, and technique, if appropriate, such as entry site for contrast medium, anesthetic, and area to be radiographed. May order procedures to prevent infection or contamination of patient or environment.	
6. Performer writes orders and recommendations in patient's chart explicitly so that nurses, technologists, residents and other personnel can prepare patient or be scheduled for work.	
7. Performer gives information to secretary for scheduling. Signs requisition sheet if appropriate.	

TASK DESCRIPTION SHEET

Task Code No. 329

This is page 1 of 5 for this task.

1. What is the output of this task? (Be sure this is broad enough to be repeatable.)

Decision on going ahead with lymphangiography;patient reassured;dye and anesthetic injected;technique decided;injector-heater set up with contrast medium; anesthetic injected and incision made;lymphatic vessel exposed and tied;needle with catheter inserted in vessel and position checked;contrast medium injected;incision(s) sutured;lymphangiograms ordered and assessed for quality;delayed lymphadeography ordered;medical impressions and after care orders recorded.

2. What is used in performing this task? (Note if only certain items must be used. If there is choice, include everything or the kinds of things chosen among.)

X-ray requisition form and patient's chart;relevant radiographic materials;view boxes;telephone;pen;sterile gloves;local and topical anesthetics;Evans blue (dye);sterile empty syringes and needles;antiseptic and saline solutions;swabs;bandages;gauze,sponges; dressings;tape;iodized oil contrast medium;injector-heater machine;sterile scalpels;forceps;suture needle,thread;lymphangiography needles;scissors emergency cart

3. Is there a recipient, respondent or co-worker involved in the task? Yes...(X) No...( )

4. If "Yes" to q. 3: Name the kind of recipient, respondent or co-worker involved, with descriptions to indicate the relevant condition; include the kind with whom the performer is not allowed to deal if relevant to knowledge requirements or legal restrictions.

Any patient to have lymphangiography;accompanying adult if pediatric patient;radiologist;clinician; technologist;nursing and clerical personnel

5. Name the task so that the answers to questions 1-4 are reflected. Underline essential words.

Conducting lymphangiography of any pt., by deciding whether to proceed;reassuring pt.;injecting dye and anesthetic as appropriate;deciding on entry site(s); setting up injector-heater with contrast medium;injecting anesthetic;exposing lymphatic vessel(s) by incising and tying;inserting needles with tubes;testing for perforation and placement using air in syringe and radiography;connecting injector-heater; checking progress of injection;deciding when to terminate;removing needles;suturing incisions;ordering and evaluating lymphangiograms; ordering delayed lymphadenograms;recording medical impressions and follow-up orders.

List Elements Fully

Performer receives the x-ray requisition form and medical information on a patient scheduled for lymphangiography (radiographic study of the lymphatic vessels and nodes using a contrast medium).

1. Performer reads the patient's requisition form and relevant medical information to become familiar with the case or to review material seen earlier. Performer reviews any diagnostic information already collected. May examine prior radiographs on view box. Notes any recommendations made on technique,and any other relevant medical information such as allergies. Notes whether patient has an infectious or communicable condition, whether female patient is pregnant.

2. Checks to see that patient (or authorized adult) has signed consent for procedure. If not, informs appropriate co-worker and either terminates examination or has it delayed until written consent is obtained.

3. Performer greets patient and, if pediatric patient, accompanying adult, in designated area. Attempts to reassure patient (and adult if present); explains and/or answers questions. Performer examines and notes the patient's relevant body structure for purposes of technique.Questions patient or adult

OK-RP;RR;RR

6. Check here if this is a master sheet..(X)

TASK DESCRIPTION SHEET (continued)

Task Code No. 329

This is page 2 of 5 for this task.

List Elements Fully

on symptoms;determines whether female patient may be pregnant. May order sedation. Signs order if appropriate.

4. Performer notes whether there have been any changes in the patient's condition since the requisition was made to do the procedure which would indicate sufficient reason to cancel. May have clinician called; discusses condition and any alternative steps.
    a. Performer decides whether to proceed or not based on evaluation of patient's condition.
    b. If performer decides not to proceed, records on patient's chart. Informs appropriate co-worker of cancellation and has patient returned to room. If appropriate, orders rescheduling of patient or scheduling for alternative procedure.
5. If performer decides to proceed, specifies entry sites for injection of dye and anesthetic. Informs appropriate co-workers to prepare patient and materials for injection in feet or hands, depending on area of interest.
    a. Performer explains procedure to patient or accompanying adult.Stresses the importance of remaining still during procedure. Reassures patient and does so as deemed necessary throughout procedure.
    b. Checks tray prepared with materials needed for the procedure. Checks that emergency cart is present. Requests any missing objects. Dons sterile gloves.
    c. Checks whether patient has been properly prepared. Indicates any needed adjustments.
6. Performer injects anesthetic and dye:
    a. Performer cleanses the sites of the injections (usually the web between the toes on each foot) by swabbing with prepared antiseptic solution.
    b. Checks amount of local anesthetic to be injected as shown by nurse. Draws into sterile syringe. Checks Evans blue dye and draws into same syringe in appropriate amount. Mixes together in syringe.
    c. Performer inserts needle in each designated location on each foot (or hand); injects mixture of anesthetic and dye;removes needle and swabs with sterile solution.
    d. Performer waits for areas to become anesthetised and for lymph ducts (such as on the back of foot) to become visible due to the injected dye.
7. Performer examines site such as patient's feet and selects a lymphatic duct on each foot (or hand) for insertion of needle (cannulation).
8. Performer prepares syringe with local anesthetic; chooses site for anesthetic and cleanses with antiseptic. Inserts needle subcutaneously and intradermally,and injects anesthetic. Waits for anesthetic to take effect. Checks for effectiveness by probing with needle. May reinject with anesthetic if needed.

    Performer decides whether to do each foot (or hand) in parallel steps or sequentially, and carries out steps described below as appropriate.
9. Performer prepares device to inject contrast medium (iodized oil) or gives orders to have this done:
    a. Has syringes filled with specified amounts of contrast oil solution.
    b. Places in injector-heater machine. Checks that there is no air in the system.
    c. Selects appropriate temperature for heater to maintain appropriate con-

TASK DESCRIPTION SHEET (continued)

Task Code No. 329

This is page 3 of 5 for this task.

List Elements Fully

List Elements Fully

sistency of medium; has this checked and adjusted continuously.

10. When area for incision is properly anesthetized, makes incision in foot (or hand) to reach the lymphatic vessels selected. Uses sterile scalpel to cut through skin and expose but not penetrate lymph vessels. Has co-worker sponge away blood or does so personally and repeats as needed throughout procedure.

11. Performer attempts to select and tie one lymphatic vessel at site. Uses small forceps to pick out and separate the vessel from the others. If performer has difficulty doing this, may enlarge incision or make another; injects with anesthetic if needed.

    Once a lymphatic vessel has been isolated, performer uses suture thread to loosely tie it off from the other vessels, making it accessible for cannulation.

12. Performer selects a special needle for lymphangiography with tubes attached. Attempts to penetrate lymphatic vessel so that the needle enters the vessel, does not go through it, and is not lodged in the vessel wall.

13. Performer checks position of needle to be certain it is in proper position to carry the contrast medium through the lymphatic system:

    a. Uses syringe with air to check for perforation. Attaches empty syringe to tube (attached to needle) and injects air. Notices any sign of air escape which indicates perforation of the vessel.
    b. Once the needle is inserted and there is no initial evidence of perforation, performer makes further check by injecting a small amount of contrast medium using syringe. Checks for distension of vessel.
    c. If performer decides that needle has punctured vessel, performer first attempts to adjust by advancing in the same vessel and reinserting needle. Repeats checks. If performer continues to have difficulty, performer may choose another vessel in the same area and repeat procedure. If necessary, performer may select another area and repeat all appropriate steps, including checks;may abandon attempt to cannulate both feet (or hands) and resort to other foot (or hand) solely.
    d. Once performer decides that there is no evidence of perforation,performer checks position of needle. Orders radiograph of insertion site. Makes sure patient is properly shielded. Performer inspects processed radiograph on view box. Determines whether needle is in proper position.
    e. If performer decides that needle is not in proper position, performer may adjust position, reinsert, or select another vessel. Performer repeats all the appropriate procedures, including radiography, to check needle position until performer is satisfied that needle is in correct position.
    f. Follows same procedures for other foot (or hand), checking on patient's condition as appropriate.

14. Once performer decides that the needle(s) have been properly inserted, performer checks that heater-injector is loaded with syringes containing the contrast medium in the proper amounts.

TASK DESCRIPTION SHEET (continued)

Task Code No. 329

This is page 4 of 5 for this task.

List Elements Fully

Performer selects and adjusts pressure control of the injector by considering the force of entry needed to inject the contrast medium into the lymphatic vessels, given the patient's size, age, and other conditions involved.

Performer connects the tube (attached to the needle) to a syringe containing the contrast medium. Performer turns on the injector-heater to start the flow of the contrast medium from the syringe(s) through the tube(s) and into the lymphatic system. If the injection is to start at different times for each foot (when procedure is done in sequence) performer uses screw on syringe to control flow to the appropriate foot as needed.

15. Performer allows the contrast solution to flow for an appropriate amount of time (one half to one and a half hours) or until an appropriate amount of contrast has been injected. Performer checks periodically to see that flow is progressing properly; if there are signs of adverse effects, performer may decide to provide emergency care.

16. At appropriate time, performer has radiologic technologist take radiographs of the pelvic area (to display the iliac nodes and vessels).

    When the radiographs have been processed, performer examines on a view box and determines whether the contrast medium has progressed sufficiently through the lymphatic system to demonstrate the iliac nodes and vessels.

    a. If performer determines that the contrast medium has not progressed far enough, performer allows the injection to continue. Rechecks at a later point by use of radiography or estimates the length of time still required.

List Elements Fully

    b. When the performer judges that the contrast medium has progressed sufficiently, performer turns off the injector and removes the needle(s).

17. Performer unties the lymphatic vessel(s), removes the thread, and prepares to suture the incision(s). May indicate to co-worker the suture material and needle size needed. For each incision needing suturing:

    a. Performer has saline solution prepared for irrigation of wound. Irrigates wound with saline solution by flushing with solution using syringe, or pouring over wound. May have co-worker irrigate.
    b. Performer may apply a topical anesthetic to edges of the wound.
    c. Performer threads suture needle of size chosen with suture material selected. Sews opening of incision using appropriate number of stitches to close wound. Uses appropriate tie.
    d. Performer decides on dressing and bandage to apply. May apply personally or assign to subordinate, specifying what to use.

18. Performer orders the first series of lymphangiograms to study the flow of the contrast medium through the lymphatic vessels. May record on requisition form and give to appropriate subordinate, order verbally, and/or sign order, as appropriate.

19. Performer looks at the first series of lymphangiograms on view boxes as soon as they are processed. Determines whether they are technically adequate to demonstrate the lymphatic vessels and provide sufficient information about any pathology,

TASK DESCRIPTION SHEET (continued)

Task Code No. 329

This is page 5 of 5 for this task.

List Elements Fully	List Elements Fully
blockage, or distortion of the flow, and filling of the thoracic duct. Performer may ask opinion of a clinician or another radiologist. Performer decides whether any of the radiographs should be redone or additional views taken immediately. If so, specifies what is needed and records as appropriate. Evaluates as above. 20. When the performer decides that the first series of lymphangiograms are complete, performer informs staff. Decides on number and time for delayed films (for study of the lymph nodes) to be taken. Explains to patient when to return (if out-patient). Performer fills out requisition form for delayed series (of lymphadenograms) and places for scheduling. Ensures proper clean up procedures. 21. Performer records impressions of procedure on patient's chart: a. Preliminary findings. b. How patient tolerated procedure. c. Any special nursing follow-up recommended; delayed films ordered. d. May sign chart or requisition sheet.	

TASK DESCRIPTION SHEET

Task Code No. 330

This is page 1 of 2 for this task.

1. What is the output of this task? (Be sure this is broad enough to be repeatable.)

Lymphangiograms read, interpreted; conclusions drawn and recommendations made orally or dictated; physician called about emergency signs; selected radiographs earmarked for study or library use; material rejacketed; report placed for typing.

2. What is used in performing this task? (Note if only certain items must be used. If there is choice, include everything or the kinds of things chosen among.)

X-ray requisition forms; current lymphangiograms; view boxes; old radiographic materials; ruler, protractor; anatomical reference chart; magnifying glass; telephone; dictation equipment; pen

3. Is there a recipient, respondent or co-worker involved in the task? Yes...(X) No...( )

4. If "Yes" to q. 3: Name the kind of recipient, respondent or co-worker involved, with descriptions to indicate the relevant condition; include the kind with whom the performer is not allowed to deal if relevant to knowledge requirements or legal restrictions.

Co-worker(s); lymphologist; ordering physician

5. Name the task so that the answers to questions 1-4 are reflected. Underline essential words.

Reading, interpreting and making recommendations on lymphangiograms, or giving opinions to co-workers by reviewing medical information and requisition sheet, evaluating new and old films; notifying ordering physician of emergency signs; explaining opinions or dictating findings and recommendations; placing report for typing.

List Elements Fully

Performer reads and interprets completed lymphangiograms and lymphadenograms, or provides opinions to co-workers, when requested, on interpretation and conclusions regarding lymphography and any related procedures.

1. If responding to request, performer goes to where radiographs are on view. Listens while co-worker explains problem on how to proceed next or problem of interpretation.

   If reading and interpreting own completed work, obtains the jacketed lymphangiograms and lymphadenograms. Includes the current set, any taken earlier, and any related radiographs, their requisition sheets, and prior films if available. Goes to reading area.

2. Asks about, reads, or reviews x-ray requisition forms and materials on patient's medical history (reason for request, decisions made on technique, comments from referring physician or consulting physicians, notes made during the procedure and interpretations of procedures already completed).

   If reading and interpreting own work, places relevant lymphangiograms and lymphadenograms on view boxes, including prior films. If responding to request, may ask to see prior films. (May use ruler and/or protractor and anatomical reference chart.)

OK - RP;RR;RR

6. Check here if this is a master sheet..(X)

TASK DESCRIPTION SHEET (continued)

Task Code No. 330

This is page 2 of 2 for this task.

List Elements Fully

3. Performer reads and interprets the lymphangiograms and lymphadenograms:
   a. Decides whether any abnormalities, changes, or suspicious signs warrant the immediate attention of the patient's physician. If so, telephones physician at once and discusses findings (or recommends that co-worker in charge of case do this).
   b. For own work, decides what to report and what recommendations to make. May ask opinion of co-worker or lymphologist.
   c. In response to request, decides what to recommend to co-worker. Explains interpretation and recommendations verbally, indicating how conclusions were arrived at, including medical and technical considerations.

4. Performer dictates findings (for own work) by explaining what appears on the films. Describes worrisome or suspicious signs, obvious abnormalities and/or changes over time, referring to earlier films. (Might indicate presence of artifacts which do not have medical significance).

   Indicates what implications can be drawn from findings and what conclusions and/or courses of action are warranted, including need for additional studies, tests, or courses of treatment.

   Dictates report in the style: There is ...on.... It has the characteristics of.... I believe that this indicates.... This could mean that.... It is necessary to determine whether.... This can be done by....

5. May decide whether any of the material is unusual or of special interest and warrants inclusion in museum library or should be used for study purposes.

List Elements Fully

   Marks jackets appropriately if so decided.

6. Returns own patient's radiographic material, requisition sheet and tape of dictation to proper jacket, and places to be picked up for typing.

TASK DESCRIPTION SHEET

Task Code No. 331

This is page 1 of 2 for this task.

1. What is the output of this task? (Be sure this is broad enough to be repeatable.)

Decision made on whether to approve tomography or alternative studies; request for neurologic tomography referred; recommendations made on technique; record entered and placed for scheduling; if requested reasons for refusal dictated and placed for typing.

2. What is used in performing this task? (Note if only certain items must be used. If there is choice, include everything or the kinds of things chosen among.)

X-ray requisition form and patient's medical history; relevant radiographic materials and reports; telephone; view boxes; pen; dictation equipment

3. Is there a recipient, respondent or co-worker involved in the task? Yes...(X) No...( )

4. If "Yes" to q. 3: Name the kind of recipient, respondent or co-worker involved, with descriptions to indicate the relevant condition; include the kind with whom the performer is not allowed to deal if relevant to knowledge requirements or legal restrictions.

Physician requesting tomography; clinician; specialist; clerical personnel

5. Name the task so that the answers to questions 1-4 are reflected. Underline essential words.

Deciding whether to order non-neurologic tomography for any patient or alternative studies and recommending technique in consultation with referring physician by reviewing recent radiologic studies, discussing, considering contraindications and need; approving, recommending alternative studies, and/or refusing approval; dictating reasons for refusal if requested; if approved, recommending technique for "cuts;" recording orders and recommendations; placing for scheduling and/or typing.

List Elements Fully

Performer decides whether to approve a request for tomography for any patient submitted by an ordering physician on an x-ray requisition form, by phone or in person. Performer considers requests for non-neurological tomographic studies (body section radiography of selected layers) after an earlier radiographic procedure has uncovered a suspected pathological condition.

1. Performer reads the x-ray requisition form and the patient's history to learn the nature of the problem and the reason for the request for tomography. Performer refers requests for neurologic tomography to appropriate staff.
    a. Performer studies the medical history of the patient and the radiographic materials resulting from procedures already carried out, and/or interpretations already prepared by other radiologists. (Performer places radiographs on view boxes.)
    b. Performer notes patient's radiographic history, whether patient has a communicable or infectious condition, whether female patient is pregnant.
    c. If the information provided is inadequate, performer arranges to have other materials sent or discusses needed information with relevant physician.

OK - RP;RR;RR

6. Check here if this is a master sheet..(X)

TASK DESCRIPTION SHEET (continued)

Task Code No. 331

This is page 2 of 2 for this task.

List Elements Fully

List Elements Fully

2. Performer considers the request in terms of the high radiation exposure to the patient, the long exposures involved, and the relatively high expense in comparison with need for additional information for diagnostic purposes.

   Performer considers the severity of the symptoms, the extent of definition on existing radiographs, and/or the suddenness of the appearance of the abnormalities. Performer considers alternative studies which could fill the need for additional information. May discuss with another radiologist or appropriate specialist.

3. Performer decides, based on the information and discussions, whether to approve request, order alternative studies, and/or deny the request for tomography.

4. If performer recommends against tomography, discusses with ordering physician and writes reasons for refusal on requisition sheet, or destroys requisition if agreed to by ordering physician.

   If requested by physician, performer dictates a report on the decision, presenting his or her interpretation of the existing radiographs, assessment of case, reason for refusal and any other relevant comments.

   Returns materials on patient and places dictated report to be picked up for typing.

5. If performer and physician agree on alternative studies, performer may consider recommendations on technique. Performer writes out requisition specifying orders and recommendations explicitly so that staff can prepare patient or be scheduled for work. May order procedures to prevent infection or contamination of patient or environment. Gives information to appropriate clerical personnel for scheduling. Signs requisition sheet if appropriate.

6. If performer decides to approve the request for tomography, performer decides on what technique to recommend, such as type of tube motion, the number, level and interval distance for the tomogram "cuts." May discuss with specialist. May decide to order localization using AP and lateral radiographs of prior study.

   a. Performer considers the urgency of the need and, if appropriate, expedites scheduling personally by discussing with appropriate staff person.
   b. Performer writes out requisition sheet with orders and recommendations stated explicitly so that patient can be readied and staff and patient scheduled. Signs requisition if appropriate. Gives to appropriate clerical personnel.

TASK DESCRIPTION SHEET

Task Code No. 332

This is page 1 of 2 for this task.

1. What is the output of this task? (Be sure this is broad enough to be repeatable.)

Tomograms (non-neurologic) read and interpreted; conclusions drawn and recommendations made orally or dictated; physician called about emergency signs; selected tomograms earmarked for study or library use; material rejacketed; report placed for typing.

2. What is used in performing this task? (Note if only certain items must be used. If there is choice, include everything or the kinds of things chosen among.)

X-ray requisition forms; tomograms; recent radiographs; view boxes; telephone, dictation equipment; pen; magnifying glass; protractor; anatomical reference chart

3. Is there a recipient, respondent or co-worker involved in the task? Yes...(X) No...( )

4. If "Yes" to q. 3: Name the kind of recipient, respondent or co-worker involved, with descriptions to indicate the relevant condition; include the kind with whom the performer is not allowed to deal if relevant to knowledge requirements or legal restrictions.

Co-workers; medical specialists; ordering physician

5. Name the task so that the answers to questions 1-4 are reflected. Underline essential words.

Reading, interpreting and making recommendations on non-neurological tomograms or giving opinions to co-workers by reviewing medical information and requisition sheet(s), evaluating tomograms and current films; notifying ordering physician of emergency signs; explaining opinions or dictating findings and recommendations; placing report for typing.

List Elements Fully

Performer reads and interprets completed non-neurologic tomograms, or provides opinions to co-workers and/or medical specialists, when requested, on interpretation and conclusions regarding tomograms of patients they are in charge of.

1. If responding to request, performer goes to where tomograms are on view. Listens while co-worker explains problem on how to proceed next or problem of interpretation.

   If reading and interpreting completed work, performer obtains the jacketed tomograms. Includes the current set of tomograms, their requisition sheets, and the radiographic material taken prior to tomography. Goes to reading area.

2. Asks about, reads, or reviews x-ray requisition forms and materials on patient's medical history such as reason for request, decisions made on technique (such as the depth and intervals of the "cuts"), comments from ordering physician or consulting physicians, notes made during the procedure, and interpretations made of procedures already completed.

   If reading and interpreting completed work, places tomograms on view boxes in sequence. May include prior radiographs. If responding to request, may ask to see ear-

OK - RP;RR;RR

6. Check here if this is a master sheet..(X)

TASK DESCRIPTION SHEET (continued)

Task Code No. 332

This is page 2 of 2 for this task.

List Elements Fully

lier films. (May use ruler and/or protractor and anatomical reference chart.)

3. Performer reads and interprets the tomograms:

   a. Decides whether any abnormalities, changes, or suspicious signs warrant the immediate attention of the patient's physician. If so, telephones physician at once and discusses findings (or recommends that co-worker in charge of case do this).
   b. For completed work, decides what to report and what recommendations to make. May ask opinion of co-worker.
   c. In response to request, decides what to recommend to co-worker. Explains interpretation and recommendations verbally, indicating how conclusions were arrived at, including medical and technical considerations.

4. Performer dictates findings (for completed work) by explaining what appears on the films. Describes worrisome or suspicious signs, obvious abnormalities and/or changes over time, referring to earlier films. (Might indicate presence of artifacts which do not have medical significance).

   Indicates what implications can be drawn from findings and what conclusions and/or courses of action are warranted, including need for additional studies, tests, or courses of treatment.

   Dictates report in the style: There is ...on.... It has the characteristics of.... I believe that this indicates.. ..This could mean that.... It is necessary to determine whether....This can be done by....

List Elements Fully

5. May decide whether any of the material is unusual or of special interest and warrants inclusion in museum library, or should be used for study purposes. Marks jackets appropriately if so decided.

6. Returns completed set of tomograms, requisition sheet and tape of dictation to proper jacket, and places to be picked up for typing.

TASK DESCRIPTION SHEET

Task Code No. 333

This is page 1 of 1 for this task.

1. What is the output of this task? (Be sure this is broad enough to be repeatable.)

Decision made on technique and scheduling for radiological cleft palate study; appointment made and record entered.

2. What is used in performing this task? (Note if only certain items must be used. If there is choice, include everything or the kinds of things chosen among.)

X-ray requisition sheet; patient's medical history if appropriate; telephone

3. Is there a recipient, respondent or co-worker involved in the task? Yes...(X) No...( )

4. If "Yes" to q. 3: Name the kind of recipient, respondent or co-worker involved, with descriptions to indicate the relevant condition; include the kind with whom the performer is not allowed to deal if relevant to knowledge requirements or legal restrictions.

Cleft palate clinic staff member;clerical personnel

5. Name the task so that the answers to questions 1-4 are reflected. Underline essential words.

Deciding on and scheduling cleft palate radiological study for any patient, by discussing nature of case with appropriate cleft palate clinic staff; recording orders; arranging for scheduling.

List Elements Fully

Performer decides on the scheduling of a cleft palate radiological study after receiving a requisition sheet from the cleft palate clinic or upon being contacted by phone or in person.

1. Performer discusses the case with the appropriate clinic personnel or reviews the materials sent. Determines the patient's medical history, age (usually age 4 to 14), and the purpose of the study (usually to demonstrate the motion of the structures involved in speech).

   Performer may ask about the test patterns requested by the clinic staff (such as the speech therapist) and any special tests requested. May make notes on requisition sheet.

2. Performer writes orders and recommendations on requisition sheet and arranges for scheduling. May set up appointment personally or have scheduling done by clerical staff so that patient and relevant staff can be scheduled.

OK - RP;RR;RR

6. Check here if this is a master sheet..(X)

TASK DESCRIPTION SHEET

Task Code No. 334

This is page 1 of 2 for this task.

1. What is the output of this task? (Be sure this is broad enough to be repeatable.)

Cleft palate fluoroscopy and cineradiography performed; patient rehearsed in procedure; test items substituted if needed; cine record of cleft palate test made; observations and preliminary findings recorded.

2. What is used in performing this task? (Note if only certain items must be used. If there is choice, include everything or the kinds of things chosen among.)

X-ray requisition form and patient's chart; fluoroscope with TV monitor, cine camera, controls; cephalostat (if available for positioning); shielding; list of test items; pen; telephone; lead garments

3. Is there a recipient, respondent or co-worker involved in the task? Yes...(X) No...( )

4. If "Yes" to q. 3: Name the kind of recipient, respondent or co-worker involved, with descriptions to indicate the relevant condition; include the kind with whom the performer is not allowed to deal if relevant to knowledge requirements or legal restrictions.

Any patient with cleft palate (usually 4 to 14 years) and accompanying adult; radiologic technologist; physician from cleft palate clinic

5. Name the task so that the answers to questions 1-4 are reflected. Underline essential words.

Conducting a fluoroscopic and cineradiographic cleft palate study of any patient by reviewing materials and reassuring patient and accompanying adult; rehearsing patient in test patterns, selecting alternatives; checking patient position and technical factors on fluoroscope monitor; making cine record while instructing patient in test patterns; deciding when test is completed; recording observations and preliminary findings.

List Elements Fully

Performer receives the x-ray requisition form and medical information on a patient scheduled for a cleft palate study (radiographic study of the structures involved in speech, usually done on patients 4 to 14 years).

1. Performer reads the patient's requisition form and relevant information to become familiar with the case and/or to review materials seen or discussed earlier (in consultation). Notes any medically relevant information.

   Notes recommendations on technique and any special test procedures such as test pattern requested by speech therapist.

2. Performer greets patient and any accompanying adult in examination room. Attempts to reassure patient and adult. Answers questions. Converses with child preparatory to enlisting child's cooperation.

3. Performer explains to child what positions he or she will be in, and what sounds to make or things to do. Performer then rehearses the procedures with the patient, giving orders in simulation of the actual testing, and checking and correcting child's execution of the test sounds. Execution of activities may include production of various vowel sounds, swal-

OK - RP;RR;RR

6. Check here if this is a master sheet..(X)

TASK DESCRIPTION SHEET (continued)

Task Code No. 334

This is page 2 of 2 for this task.

List Elements Fully

lowing, blowing through a straw and/or speaking words or phrases.

If the performer finds that the child has difficulty or resists saying certain words or doing certain procedures, or is not comfortable with English words (patient may not be English speaking) performer selects and substitutes alternative test items, and rehearses these with patient or accepts those sounds the patient is prepared to make for the test.

4. When performer is satisfied that the patient understands, performer instructs technologist in how the test will be accomplished, depending on whether the room is equipped with a control booth and intercom and the need for someone to assist child. Performer may decide to use intercom to instruct child or be present personally. If there is any possibility that performer will remain with or assist child, performer dons protective lead garments.

   Performer checks that the cineradiography equipment is ready, that technical factors have been set, that patient and anyone to remain in room has been properly shielded.

   Performer positions patient with head in lateral position and overhead fluoroscope unit positioned to demonstrate area on the fluoroscope TV monitor.

   Performer may dim room lights; activates fluoroscope to check patient's position and the adequacy of the technical factors. (If available, uses cephalostat for positioning patient's head.)

List Elements Fully

5. When performer judges that the patient is properly positioned and that the technical quality of the fluoroscopic image is adequate, performer asks child to phonate as ordered.

6. Performer then activates cine camera and fluoroscope or has technologist do so. Performer has child go through the test patterns already rehearsed.

   a. As required, performer may stop fluoroscopy and cineradiography and assist child, or has technologist assist.
   b. Performer observes the movements of the organs of speech on the TV monitor. Notes patient's reactions. Performer may make notes while observing.

7. When the performer determines that the test has been completed, shuts off fluoroscope and cine camera, or has technologist terminate. Returns to patient and, if appropriate, answers questions or calms patient.

8. Performer records impressions of the test procedure on the patient's chart:

   a. Preliminary findings.
   b. How patient reacted to or performed test patterns.
   c. Whether anything occurred of immediate significance. If so, may call clinic physician and discuss at once.
   d. May sign chart or requisition sheet.

TASK DESCRIPTION SHEET

Task Code No. 335

This is page 1 of 3 for this task.

1. What is the output of this task? (Be sure this is broad enough to be repeatable.)

Report dictated on reading, interpretation and recommendations on cineradiographs of cleft palate study, or co-workers questions answered about interpretation, and/or interpretation and films presented to case conference and questions answered; dictated report placed for typing and distributed; final report filed.

2. What is used in performing this task? (Note if only certain items must be used. If there is choice, include everything or the kinds of things chosen among.)

Cine film(s) in cassette(s), projector and screen; patient's x-ray requisition form, relevant radiographs (old and current); transcripts of reports, notes and recommendations; view boxes; marking tape; telephone

3. Is there a recipient, respondent or co-worker involved in the task? Yes...(X) No...( )

4. If "Yes" to q. 3: Name the kind of recipient, respondent or co-worker involved, with descriptions to indicate the relevant condition, include the kind with whom the performer is not allowed to deal if relevant to knowledge requirements or legal restrictions.

Staff and patient at cleft palate case conference; co-worker(s); physician on staff of cleft palate clinic; clerical personnel; cleft palate patient

5. Name the task so that the answers to questions 1-4 are reflected. Underline essential words.

Reading, interpreting and making recommendations on cineradiographic cleft palate studies, and/or advising co-workers on interpretation, and/or presenting interpretation at cleft palate case conference, by reviewing medical information and requisition sheet, evaluating new cine film and relevant old films; notifying ordering physician of emergency signs; explaining opinions, making presentation, or dictating findings and recommendations; and/or answering questions; placing report for typing or final report for filing.

List Elements Fully

Performer reads and interprets cine film records of cleft palate examination of any patient, provides opinions to co-workers asking assistance in interpreting their own work, and/or presents interpretations and explanations of cleft palate studies to case conferences conducted in cooperation with staff at the cleft palate clinic.

1. Performer prepares for reading and interpreting cine films of a cleft palate study by obtaining the relevant materials.
   a. If responding to request, performer goes to where the cine films are to be presented. Watches screen and listens while co-worker explains problem with interpretation. May ask to see earlier cineradiographs and relevant case history.
   b. If reading and interpreting own cineradiographs, performer obtains the developed cine film cassette, a projector, the x-ray requisition form, relevant case materials, and own notes. Goes to viewing area.
   c. If attending a case conference, performer checks memo indicating the patient(s) involved. Has the proper cine cassette(s), requisition sheets, record of own report, earlier film materials, relevant case materials, and a

OK - RP;RR;RR

6. Check here if this is a master sheet..(x)

TASK DESCRIPTION SHEET (continued)

Task Code No. 335

This is page 2 of 3 for this task.

List Elements Fully

projector collected for review and to take to meeting, or obtains personally.

d. If not already done, performer removes the cine film from the cassette, threads this into projector and projects on screen. May ask to see or may view older films. Observes still radiographs on view boxes.

e. Performer asks about, reads, and/or reviews all the relevant case material. If appropriate, may adjust speed of projector, turn film forward or back and may comment on what is being observed. May write notes for use at conference. May use tape to mark film.

2. Performer points out or notes what is being demonstrated on the film in relation to the purpose of the study. Performer may estimate the size, length and thickness of the palate, the degree of motion involved, the extent of the impairment or other relevant questions.

   a. If performer is preparing own report, decides what is relevant.
   b. If performer is answering co-workers questions, focuses on the co-worker's problem in relation to what is evident on the film(s).
   c. If performer is attending case conference, performer may describe case to audience, may introduce patient, may have film shown or present personally. Performer decides what to show and explain.
   d. In each case, performer describes what appears on the films, explains implications. Points out abnormalities. (May explain idiosyncratic artifacts due to cine technique.) Performer may refer to changes over time, referring or switching to earlier materials.

List Elements Fully

   e. If appropriate, performer answers questions, reshows sections of the film as requested.

3. Performer decides what conclusions can be drawn, what recommendations to make, and what to report (orally if answering request or addressing conference; dictated if required for report).

   a. Decides whether any abnormalities or changes warrant the immediate attention of the patient's physician. If so, telephones physician at once and discusses findings, makes recommendations to co-worker, or indicates this at conference.
   b. Explains interpretation and recommendations. Indicates how conclusions were arrived at, including medical and technical considerations.
   c. Indicates what implications can be drawn from findings and what conclusions and/or courses of action are warranted, including need for additional studies, tests, or courses of treatment.
   d. Dictates report in the style: There is...on.... It has the characteristics of.... I believe that this indicates.... This could mean that.... It is necessary to determine whether.... This can be done by....

4. Performer terminates interpretation at conference or when dictating by stopping projector; rewinds and replaces film in cassette. If appropriate, arranges to have materials returned, including projector, cassettes of films, requisition sheets and other case history materials.

   a. If interpreting own materials for report, may decide whether any of the material is unusual or of spe-

TASK DESCRIPTION SHEET (continued)

Task Code No. 335

This is page 3 of 3 for this task.

List Elements Fully	List Elements Fully
cial interest and warrants inclusion in museum library or should be used for study purposes. Marks appropriately if so decided. Places tape of dictation for typing; edits when ready and arranges for copy to be sent to cleft palate clinic. b. If making presentation at case conference, performer participates in discussion to determine final decisions on treatment. When conference report is received, including official diagnosis and treatment prescribed, performer notes and places in personal files.	

TASK DESCRIPTION SHEET

Task Code No. 336

This is page 1 of 2 for this task.

1. What is the output of this task? (Be sure this is broad enough to be repeatable.)

Radiology resident shown and explained procedures involved with lymphangiography; resident evaluated for readiness to do activities under supervision; resident observed and criticized; resident evaluated for readiness to do tasks without direct supervision; resident's work spot checked; questions answered; opinions on work given as requested; evaluation noted informally.

2. What is used in performing this task? (Note if only certain items must be used. If there is choice, include everything or the kinds of things chosen among.)

X-ray requisition forms; materials and equipment needed for procedures in lymphangiography; related radiographs; view boxes

3. Is there a recipient, respondent or co-worker involved in the task? Yes...(X) No...( )

4. If "Yes" to q. 3: Name the kind of recipient, respondent or co-worker involved, with descriptions to indicate the relevant condition; include the kind with whom the performer is not allowed to deal if relevant to knowledge requirements or legal restrictions.

Radiology resident to be instructed in lymphangiography procedures; any patient involved; lymphologists; clinicians; supervisor of residents

5. Name the task so that the answers to questions 1-4 are reflected. Underline essential words.

Providing clinical training for radiology residents in lymphangiography procedures by demonstrating procedures, explaining what is being done, answering questions; deciding when residents can perform tasks under direct supervision: observing and correcting; deciding when tasks can be done without direct supervision; spot checking and correcting; advising as requested or as deemed necessary.

List Elements Fully

Performer provides clinical training to residents in radiology in the area of lymphangiography covering choice of examinations, medical aspects of procedures, interpretation of radiographic material, and possible recommendations and treatments.

1. Performer provides demonstration, explanation, informal evaluation and supervision in: reading requests for lymphangiography and deciding on best procedure; what to look for; available medical and technical procedures including anesthetics, surgical entry, use of contrast media, technical equipment, positions and angles, contraindications; providing technical and medical interpretation of radiographic materials; learning range of medical conclusions that can be drawn, alternative and additional tests, and courses of treatment to consider.

2. When performer is assigned a resident, may select times, patients, and procedures to demonstrate, and may explain to resident while performer carries out own tasks.
   a. Performer explains what will be taught.
   b. Performer may narrate the steps, may explain what is being done, or may explain the basis for decisions and actions.

OK - RP;RR ;RR

6. Check here if this is a master sheet..(X)

TASK DESCRIPTION SHEET (continued)

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This is page 2 of 2 for this task.

List Elements Fully

c. Performer may decide to solicit questions to find out what the resident understands, may answer questions, or may elaborate on the explanation of what is being done, concentrating on the relevant skills and knowledges.

d. Performer decides when the resident has observed sufficiently and has a clear enough understanding of a procedure to carry it out under close, direct supervision and/or to assist.

3. Performer supervises and observes resident carrying out activities assigned.

   a. Performer asks the resident to do all or part of a procedure and remains at the side of the patient or carries out own portion and watches the resident perform the assigned activity.
   b. While observing, performer decides whether the activity is being done properly, whether there is a specific problem, whether there is need to demonstrate the procedure again or explain, and does so.
   c. Performer may comment on the performance, encourage or correct as deemed necessary, or do this later.
   d. Performer may decide to intervene and take over the procedure, explaining to the resident what was done incorrectly at that point or later.
   e. If decision is to demonstrate again, performer may redo and have the resident observe, or have resident repeat the procedure until it is done properly.
   f. Performer decides which procedures or activities can be done by the resident without direct supervision (although radiologist remains responsible). Informs proper supervisors, notes for own use, and/or tells this to resident.

List Elements Fully

4. Performer spot checks resident carrying out activities without direct supervision or responds to requests for guidance, assistance or further instruction.

   Performer proceeds as in steps 2 or 3 as appropriate, observing, noting areas needing improvement, determining nature of problem, assisting, giving opinions, answering questions, and providing further instruction on how to deal with unusual circumstances. Reinforces correct work. Suggests areas for improvement.

5. When patients are present for demonstrations, performer may explain presence of resident; when observing, performer may explain own presence.

6. Performer informally notes the extent of learning or proficiency of resident throughout the training:

   a. May decide to discuss performance with resident at any time.
   b. Does not keep formal records on what was taught, or on resident's progress.
   c. May make personal notes for use in later evaluation meetings.

TASK DESCRIPTION SHEET

Task Code No. 337

This is page 1 of 2 for this task.

1. What is the output of this task? (Be sure this is broad enough to be repeatable.)

Presentation prepared and made on radiology developments or case studies; presentations of physicians in pulmonary medicine and/or thoracic surgery or surgical pathology listened to; discussions participated in.

2. What is used in performing this task? (Note if only certain items must be used. If there is choice, include everything or the kinds of things chosen among.)

Radiographic and medical equipment; radiographic materials; case histories and reports; view boxes, slide projectors

3. Is there a recipient, respondent or co-worker involved in the task? Yes...(x) No...( )

4. If "Yes" to q. 3: Name the kind of recipient, respondent or co-worker involved, with descriptions to indicate the relevant condition; include the kind with whom the performer is not allowed to deal if relevant to knowledge requirements or legal restrictions.

Surgeons; pathologists; radiologists; pulmonary and thoracic surgery residents

5. Name the task so that the answers to questions 1-4 are reflected. Underline essential words.

Participating in meetings with pulmonary specialists, surgeons and pathologists to discuss new developments, cases of interest, and case problems in pulmonary medicine, surgical pathology and thoracic surgery by planning and presenting new developments in the radiologic field, interesting case studies or problems in current cases, and/or by deciding to listen to presentations about new developments in surgery, interesting case studies or case problems, and participating in discussions.

List Elements Fully

Performer attends meetings of medical staff and co-workers in pulmonary medicine and thoracic surgery to discuss areas of mutual concern.

1. Performer may prepare presentations describing new work in the field of general radiology.
    a. Performer decides what to present and in what degree of depth and detail.
    b. Decides on how to make presentation and what to use.
    c. May prepare outline, obtain special instructional materials, do research on topic for use in presentation. May have resident assist.
    d. May prepare slides from own source of radiographs or may obtain existing radiographic material and slides from library. May have resident assist.
    e. At meeting, when performer is called upon, places radiographs, spot films or other radiographic materials on view box or uses slide projector. Describes work selected,answers questions and participates in discussion. May recommend further reading.

    Performer, may, when appropriate, demonstrate or simulate new and/or relevant techniques, equipment or procedures.

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6. Check here if this is a master sheet..(x)

TASK DESCRIPTION SHEET (continued)

Task Code No. 337

This is page 2 of 2 for this task.

List Elements Fully

  - f. Performer replaces materials and equipment or has this done.

2. Performer may attend conferences at which the departments involved present case studies and raise problems, or performer may choose a case which is of educational interest from the library or personal files.
  - a. Performer may be told beforehand by department head or conference leader what current or past cases will be presented for discussion, or performer will discuss the type of information to be covered in order to select a relevant case.
  - b. Performer obtains the radiographic materials related to the cases selected or selects appropriate case. May have resident gather materials; if so, reviews to see that they are appropriate.
  - c. Performer reviews the radiographs and the requisition sheets involved, and any other relevant medical information such as reports and interpretations already made.
  - d. Performer may make notes to use as reference, pointing out fine points with regard to interpretation of the radiographs in connection with pathological symptoms and conditions.
  - e. At the conference, performer presents the radiographs involved as appropriate, presents interpretations,and makes relevant points so as to instruct the audience in the reasoning involved. Participates in the discussion; answers questions. May suggest reference articles on subjects involved.
  - f. Performer replaces radiographic materials or has these replaced.
  - g. If current case studies are involved, performer may maintain files on the case(s), read and file reports covering final diagnoses and treatment prescriptions.

3. Performer may decide to attend presentation by surgeons, pathologists or co-workers. May make notes, ask questions and/or participate in discussion.

4. Performer may decide to attend presentation about a particular case that is of interest. May make notes, ask questions and/or participate in discussion.

5. Performer may decide to present relevant problems that performer is personally having trouble with and ask for comments and suggestions from participants.
  - a. Selects the case material needed to present the problem.
  - b. Makes presentation and poses problems involved.
  - c. Listens and participates in resulting discussions.

TASK DESCRIPTION SHEET

Task Code No. 338

This is page 1 of 2 for this task.

1. What is the output of this task? (Be sure this is broad enough to be repeatable.)

Presentation prepared and made in plastic surgery and radiology developments or case studies; discussions participated in.

2. What is used in performing this task? (Note if only certain items must be used. If there is choice, include everything or the kinds of things chosen among.)

Radiographic and medical equipment; radiographic materials; case histories; view boxes, slide projectors

3. Is there a recipient, respondent or co-worker involved in the task? Yes...(X) No...( )

4. If "Yes" to q. 3: Name the kind of recipient, respondent or co-worker involved, with descriptions to indicate the relevant condition; include the kind with whom the performer is not allowed to deal if relevant to knowledge requirements or legal restrictions.

Plastic surgeons; radiologists; resident

5. Name the task so that the answers to questions 1-4 are reflected. Underline essential words.

Participating in meetings of physicians involved with plastic surgery to discuss new developments, cases of interest, and case problems in the field, by planning and presenting new developments in radiology, reading and interpreting radiographs of interesting case studies; and participating in discussions.

List Elements Fully

Performer attends meetings of plastic surgeons and co-workers to discuss areas related to plastic surgery.

1. Performer may prepare presentations describing new work in the field of general radiology that is relevant.
   - a. Performer decides what to present and in what degree of depth and detail.
   - b. Decides on how to make presentation and what to use.
   - c. May prepare outline, obtain special instructional materials, do research on topic for use in presentation. May have resident assist.
   - d. May prepare slides from own source of radiographs or may obtain existing radiographic material and slides from library. May have resident assist.
   - e. At meeting, when performer is called upon, places radiographs, spot films or other radiographic materials on view box or uses slide projector. Describes work selected, answers questions and participates in discussion. May recommend further reading.

   Performer, may, when appropriate, demonstrate or simulate new and/or relevant techniques, equipment or procedures.

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6. Check here if this is a master sheet..(X)

TASK DESCRIPTION SHEET (continued)

Task Code No. 338

This is page 2 of 2 for this task.

List Elements Fully	List Elements Fully
f. Performer replaces materials and equipment or has this done. 2. Performer may attend conferences at which plastic surgeons present case studies and raise problems. a. Performer may be told beforehand by department head or conference leader what current or past cases will be presented for discussion, or performer will discuss the type of information to be covered in order to select a relevant case. b. Performer obtains the radiographic materials related to the cases selected or selects appropriate case. May have resident gather materials. If so, reviews to see that they are appropriate. c. Performer reviews the radiographs and the requisition sheets involved, and any other relevant medical information such as reports and interpretations already made. d. Performer may make notes to use as reference, pointing out fine points with regard to interpretation of the radiographs in connection with symptoms and conditions. e. At the conference, performer presents the radiographs involved as appropriate and presents interpretation and makes relevant points so as to instruct the audience in the reasoning involved. Participates in the discussion; answers questions. May suggest reference articles on subjects. f. Performer replaces radiographic materials or has these replaced. g. If current case studies are involved, performer may maintain files on the case(s).	

TASK DESCRIPTION SHEET

Task Code No. 339

This is page 1 of 3 for this task.

1. What is the output of this task? (Be sure this is broad enough to be repeatable.)

Decision made on ordering and/or deciding on type of radiographic gastrointestinal or biliary study to order; recommendations made on technique, contrast media, preparatory patient regimen, as appropriate; record entered and placed for scheduling.

2. What is used in performing this task? (Note if only certain items must be used. If there is choice, include everything or the kinds of things chosen among.)

X-ray requisition form and patient's chart; relevant radiographic materials; telephone; view boxes

3. Is there a recipient, respondent or co-worker involved in the task? Yes...(X) No...( )

4. If "Yes" to q. 3: Name the kind of recipient, respondent or co-worker involved, with descriptions to indicate the relevant condition; include the kind with whom the performer is not allowed to deal if relevant to knowledge requirements or legal restrictions.

Physician requesting gastrointestinal and/or biliary study; appropriate clinician specialist; anesthesiologist; secretary or clerk

5. Name the task so that the answers to questions 1-4 are reflected. Underline essential words.

Deciding on type of gastrointestinal and/or biliary radiographic examinations to order for any patient in consultation with referring physician and/or specialists, by reviewing case history and relevant materials, discussing, considering contraindications and need; approving, recommending alternative studies, and/or refusing approval; dictating reasons for refusal if requested; if approved, recommending technique, ordering anesthetic, patient preparation; recording orders and recommendations; placing for scheduling and/or typing.

List Elements Fully

Performer decides on what radiographic examinations of the gastrointestinal (GI) tract and/or the biliary tract to order upon receipt of a request from an ordering physician on an x-ray requisition form, by phone, or in person. Request may be for a common examination using contrast medium such as GI series (using barium sulfate),oral cholecystography (study of gall bladder and biliary ducts),or for special procedures such as hypotonic duodenography (study of duodenum with peristalsis suspended) or intravenous cholangiography (study of biliary tract),for use in initial diagnostic examinations,or after an earlier radiographic procedure has uncovered a suspected pathological condition or must be redone. Studies ordered can include any procedure for radiographic study of the gastrointestinal or biliary tracts.

1. Performer reads the x-ray requisition form and the patient's history to learn the nature of the problem and the reason for the request.
   a. If the condition or the nature of the request warrants it,performer may arrange to discuss request with patient's attending physician or appropriate specialist.
   b. Performer studies the medical history of the patient;notes radiologic history and materials resulting from earlier studies

OK-RP:RR:RR

6. Check here if this is a master sheet..(X)

TASK DESCRIPTION SHEET (continued)

Task Code No. 339

This is page 2 of 3 for this task.

List Elements Fully

and related reports. Notes whether patient has infection, communicable condition, whether female patient is pregnant.

c. If the performer finds that the information provided is inadequate, performer arranges to have other materials sent or discusses with relevant physician.

2. Performer decides whether there are contraindications to the procedure requested such as adverse reactions to prior studies or allergies (such as to the contrast medium used for cholangiography).

   Performer considers any contraindications in relation to the need for additional information for diagnostic purposes. Considers the severity of the symptoms, the extent of definition on any current radiographs, and/or the suddenness of the appearance of the abnormalities in relation to the possible adverse effects on patient. Performer considers alternative studies which could fill the need for additional information. May discuss with another radiologist or appropriate specialist.

3. Performer decides whether to approve request, order additional or alternative studies, reorder earlier studies, or recommend no radiography, based on the information obtained and any discussion.

4. If performer recommends against a request, discusses with ordering physician and writes reasons for refusal on requisition sheet, or destroys requisition if agreed to by ordering physician.

   If requested by physician, performer dictates a report on the decision, presenting his or her interpretation of any current radiographs, assessment of case, reason for refusal,and any other relevant comments.

List Elements Fully

Returns materials on patient,and places dictated report to be picked up for typing.

5. If performer and physician agree on alternative studies, performer may consider recommendations on technique. Performer writes out requisition,specifying orders and recommendations explicitly so that staff can prepare patient or be scheduled for work. Gives information to appropriate clerical personnel for scheduling. Signs requisition sheet if appropriate.

6. If performer decides to approve the request for the study, performer decides on technique to recommend, depending on nature of study and patient's condition. Discusses with specialist or surgeon if appropriate. Decisions on technique include such things as oral, intravenous, or percutaneous introduction of contrast medium; choice of entry site for injections, special views or positions.

   a. Performer may decide on use of anesthetic if appropriate; may discuss with anesthesiologist.
   b. Performer decides on the preparatory procedures or regimen to prescribe for patient (such as preparatory food intake or cleansing enema), whether to prescribe standard preparation for given study or special regimen.
   c. Performer considers the urgency of the need and, if appropriate, expedites scheduling personally by discussing with appropriate staff person. May order procedures to prevent infection or contamination of patient or environment.
   d. Performer writes orders, recommendations on technique, decisions on anesthetic,and order for patient's preparation on patient's chart ex-

TASK DESCRIPTION SHEET (continued)

Task Code No. 339

This is page 3 of 3 for this task.

List Elements Fully	List Elements Fully
plicitly so that physicians, nurses, technologists and other personnel can prepare patient or be scheduled for work. e. Performer gives information to appropriate secretary for scheduling. Signs requisition sheet if appropriate.	

TASK DESCRIPTION SHEET

Task Code No. 340

This is page 1 of 4 for this task.

1. What is the output of this task? (Be sure this is broad enough to be repeatable.)

Decision made on whether to go ahead with hypotonic duodenography;patient reassured;anticholinergic drug injected;naso-gastric tube inserted;fluoroscopy done and spot films taken after injection of liquid barium through tube;injection of drug to arrest peristaltic action,injection of air contrast medium through tube;radiographs ordered;complete set of radiographs approved;medical impressions,needed follow-up recorded.

2. What is used in performing this task? (Note if only certain items must be used. If there is choice, include everything or the kinds of things chosen among.)

X-ray requisition form and patient's chart;related radiographic material;telephone;pen;prepared tray for procedure with anticholinergic drug;sterile nasogastric catheter and guide wire,barium solution,sterile water,probantheline bromide,sterile syringes and needles,empty syringe,antiseptic solution,swabs;protective lead garments;sterile gown and gloves;scout film;view boxes;fluoroscope,TV monitor,spot film device with cassettes or roll film.

3. Is there a recipient, respondent or co-worker involved in the task? Yes...(X) No...( )

4. If "Yes" to q. 3: Name the kind of recipient, respondent or co-worker involved, with descriptions to indicate the relevant condition; include the kind with whom the performer is not allowed to deal if relevant to knowledge requirements or legal restrictions.

Any non-pediatric pt. to have hypotonic duodenography;radiologic technologist;referring MD;radiologist

5. Name the task so that the answers to questions 1-4 are reflected. Underline essential words.

Conducting hypotonic duodenography of any non-pediatric patient by deciding whether to go ahead based on patient's condition and scout film;reassuring pt.; injecting anticholinergic drug;inserting naso-gastric tube into duodenum under fluoroscopy;injecting barium solution through tube;fluoroscoping and taking spot films;injecting solution to stop peristaltic action in duodenum;fluoroscoping and taking spot films;injecting air contrast through tube;fluoroscoping and taking spot films;ordering radiographs;deciding when examination is completed by viewing radiographs;recording medical impressions and ordering follow-up care.

List Elements Fully

Performer receives the x-ray requisition form and medical information on a patient scheduled for hypotonic duodenography (radiography of the duodenum with contrast medium and with peristaltic action arrested).

1. Performer reads the patient's requisition form and relevant medical information to become familiar with the case or to review material seen earlier. Performer reviews any diagnostic information already collected. May examine prior radiographs on view box. Notes any recommendations made on technique or pre-examination regimen for patient. Notes any other relevant medical information such as history of hypertension, glaucoma or cardiac conditions (which would be contraindications). Notes whether patient has an infectious or communicable condition, whether female patient may be pregnant.

2. Checks to see that patient has signed consent for procedure. If not, informs appropriate co-worker and either terminates examination or has it delayed until written consent is obtained.

3. Performer greets patient in examination room. Attempts to reassure patient and explains what will be done. Answers questions. Performer examines patient and notes relevant

OK-RP ; RR; RR

6. Check here if this is a master sheet..(X)

TASK DESCRIPTION SHEET (continued)

Task Code No. 340

This is page 2 of 4 for this task.

List Elements Fully

symptoms. Checks on any pre-examination regimen ordered. Checks whether female patient may be pregnant.

4. Performer orders scout film and views when ready. Checks for proper shielding.
   a. Performer decides whether the technical quality of the film is adequate. If not, indicates needed adjustments to technologist.
   b. Performer decides whether any contents of the duodenum will interfere with the current examination, such as food or barium traces from an earlier study.
5. Performer decides whether to go ahead with the examination based on evaluation of patient's condition, contraindications and/or evidence on scout film. May have clinician or specialist called; discusses patient's current condition and any alternative steps.
6. If performer decides not to proceed, records reasons and any recommendations on patient's chart. Informs appropriate co-worker of cancellation and has patient returned to room. If appropriate, orders rescheduling of patient or scheduling for alternative procedure.
7. If performer decides to proceed, makes final decisions on the site of entry for injection of the anticholinergic drug, based on requisition sheet, chart, and own examination. If appropriate, writes decisions on requisition sheet and informs appropriate co-workers so that patient, materials and technical factors for fluoroscopy can be prepared or set.
8. When informed that patient is ready, performer checks whether patient has been properly prepared and shielded. Performer indicates any needed adjustments. Reassures patient and does so as deemed needed throughout procedure. Explains that performer will ask the patient to cooperate from time to time during procedure, and does so as appropriate.
9. Performer checks that all materials needed are present and that staff is shielded. Requests any missing objects. Dons protective lead garments and sterile gown.
10. Performer positions overhead fluoroscope unit over patient;may have room lights dimmed. Activates fluoroscope or has this done. Performer adjusts unit and/or patient until the intestinal tract is visible on the TV monitor. May have technical factors adjusted.
11. When the technical quality of the TV image is judged adequate, performer shuts fluoroscope and proceeds to insert the prepared naso-gastric catheter (hypotonic duodenography guided tube):
    a. Performer uses lubricant, and gently inserts catheter through nose, and guides it through the pharynx and esophagus into the stomach, and, from the stomach, into the duodenum.
    b. Performer guides the insertion by turning on the fluoroscope monitor as needed to check the progress of the catheter and to guide it in its movements down into the duodenum. May adjust unit.
    c. If the performer finds that the catheter is too soft to manipulate, performer inserts wire into catheter to stiffen it and continues procedure. When performer judges

TASK DESCRIPTION SHEET (continued)

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This is page 3 of 4 for this task.

List Elements Fully

that catheter is in place in duodenum, as viewed on fluoroscope monitor, performer removes the wire.

12. When the performer judges that the catheter has been properly placed, performer arranges for fluoroscopy with contrast solution and spot filming:

    a. If fluoroscope has spot film attachment that uses cassettes, performer has cassette inserted. Chooses full, half or quarter format and sets as appropriate. (If roll film attachment, checks that attachment is loaded with film or has this done.)
    b. Performer asks for or selects prepared barium sulfate solution. Draws up into syringe in proper amount. Performer injects contrast solution into duodenum through the catheter.
    c. Performer observes the flow of the barium solution into the duodenum on the TV monitor. Judges the amount needed to fill the duodenum and obtain a properly defined image. Injects additional contrast solution as deemed necessary.

13. When adequate contrast has been obtained, performer moves the fluoroscope unit, the patient and/or the x-ray table so as to identify,examine and observe the areas of suspected pathology in motion. May draw back catheter to provide unobstructed view.

    Performer decides what to record as spot films while viewing on monitor. Activates spot film attachment and x-ray foot pedal as appropriate. If cassette attachment, may have technologist remove cassette as spots are snapped and insert additional cassettes, or does so personally.

List Elements Fully

14. Throughout procedure performer notes patient's reactions. Decides to provide emergency care if needed.

15. Performer determines when contrast study without hypotonic effect is completed, and prepares for hypotonic study (views of duodenum with peristaltic action inhibited). May have nurse prepare and/or administer drug or does so personally.

    a. Asks for or selects prepared solution for hypotonic effect or prepares personally. Combines the anticholinergic drug (such as propantheline bromide) and sterile water in desired proportions by drawing both up into sterile syringe in appropriate amounts.
    b. Performer selects site for intramuscular injection of the solution to cause cessation of peristaltic motion in the duodenum (by chemical action). Swabs site with an antiseptic solution. Expels air in syringe. Inserts needle into muscle tissue and injects solution. Removes needle and swabs site.
    c. Performer activates fluoroscope and checks for the effect of the injection on the peristaltic motion of the duodenum by viewing on monitor.

16. When the performer judges that the required hypotonic effect has been produced, performer views the areas of the duodenum being studied in the relaxed state.

    Performer examines the areas of suspected pathology and notes their appearance without motion. Performer takes spot films as deemed needed as described above. Shuts fluoroscope.

17. After an appropriate period, performer prepares for air contrast study:

TASK DESCRIPTION SHEET (continued)

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This is page 4 of 4 for this task.

List Elements Fully

a. Performer makes sure that catheter is in duodenum by checking on TV monitor.
b. Performer uses an empty sterile syringe and injects an appropriate amount of air into the duodenum through the catheter.
c. Performer views entry of air into duodenum on fluoroscope monitor. As the area under study is filled with air, performer withdraws the catheter from the duodenum and permits it to lie within the stomach, thus allowing for full visualization of the duodenum.

18. When the performer judges that enough air contrast medium has been introduced, performer again views the areas under study by using fluoroscopy.

    Performer pays attention to the fineness of detail produced in relation to the diagnostic information needed. Performer takes spot films as deemed needed, as described above.

19. When performer determines that sufficient spot films have been taken, shuts fluoroscope.

    Performer decides whether to order overhead radiographs. If so, specifies number of radiographs, positions, and views required to technologist. May record.

20. Performer looks at the radiographs and spot films on view boxes as soon as they are processed. Determines whether they are technically adequate to demonstrate the areas under study and provide sufficient information to make possible a competent medical interpretation. Performer may ask opinion of clinician or another radiologist.

List Elements Fully

a. Performer decides whether to order additional views based on the information already available, the patient's condition and his or her radiologic history.
b. If the performer decides to order additional views, performer informs technologist, specifying what is needed. May record.
c. Performer examines additional radiographs as above.

21. When performer has determined that the examination has been completed, performer gently removes the naso-gastric catheter and reassures patient. Performer indicates to subordinates that procedure is completed. If appropriate, has decontamination and/or sanitary clean up procedures carried out. Has patient returned as appropriate.

22. Performer records impressions of procedure on patient's chart:

    a. Preliminary findings.
    b. How patient tolerated procedure.
    c. Any special nursing follow-up recommended.
    d. May sign chart or requisition sheet.

TASK DESCRIPTION SHEET

Task Code No. 341

This is page 1 of 3 for this task.

1. **What is the output of this task?** (Be sure this is broad enough to be repeatable.)

Decision made on whether to go ahead with small bowel enema study; fluoroscopy done and spot films taken after injection of barium solution through naso-enteric tube; radiographs ordered; complete set of radiographs approved; medical impressions and follow-up recommendations recorded.

2. **What is used in performing this task?** (Note if **only** certain items must be used. If there is choice, include everything or the kinds of things chosen among.)

X-ray requisition form and patient's chart; related radiographic material, current films and scout film; view boxes; telephone; pen; barium solution, naso-enteric tube (already inserted for one or more days), sterile syringe; sterile gown and gloves; protective lead garments; fluoroscope; TV monitor; spot film device and cassettes or roll film

3. Is there a recipient, respondent or co-worker involved in the task? Yes...(X) No...( )

4. **If "Yes" to q. 3:** Name the **kind** of recipient, respondent or co-worker involved, with descriptions to indicate the relevant condition; include the kind with whom the performer is not allowed to deal if relevant to knowledge requirements or legal restrictions.

Any non-pediatric patient to have small bowel enema study; radiologic technologist; referring MD; radiologist

5. **Name the task** so that the answers to questions 1-4 are reflected. Underline essential words.

Conducting small bowel enema radiographic study of any non-pediatric patient by deciding whether to go ahead based on patient's condition and scout films; reassuring patient; injecting barium solution through naso-enteric tube previously inserted; fluoroscoping and taking scout films; ordering radiographs; deciding when examination is completed by viewing radiographs; recording medical impressions and ordering follow-up care.

List Elements Fully

Performer receives the x-ray requisition form and medical information on a patient scheduled for a small bowel enema study (radiographic examination of the intestines after naso-enteric tube has been allowed to travel through the digestive tract to a point of suspected blockage).

1. Performer reads the patient's requisition form and relevant medical information to become familiar with the case or to review material seen earlier. Reviews any diagnostic information already collected and inspects relevant radiographs (such as from prior barium enema study)on view boxes. Inspects the series of radiographs showing the position of the naso-enteric tube as it traveled along the gastrointestinal tract to its current location.Performer reads any notes on the patient's current condition,preparatory regimen followed,and any recommendations on technique or requests for special views.Notes whether patient has an infectious or communicable condition, whether female patient may be pregnant.

2. If not already prepared, performer orders scout film and views on view box when ready:

   a. Performer decides whether any contents of the intestinal tract such as food, feces or barium traces from an earlier study will interfere with the current examination.

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6. Check here if this is a master sheet..(X)

TASK DESCRIPTION SHEET (continued)

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This is page 2 of 3 for this task.

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b. Performer decides whether the technical quality of the film is adequate. If not, indicates needed adjustments to technologist.

c. Performer greets patient in examination room. Reassures and answers questions. Examines and questions patient and notes relevant symptoms.

d. May have clinician or specialist called; discusses patient's current condition and any alternative steps.

3. Performer decides whether to go ahead with the examination based on evaluation of patient's condition, contraindications and/or evidence on scout film.

4. If performer decides not to proceed, records reasons and any recommendations on patient's chart. Informs appropriate coworker of cancellation and has patient returned to room. If appropriate,orders rescheduling of patient or scheduling for alternative procedure.

5. If performer decides to proceed, informs appropriate co-workers to prepare patient, materials and technical factors for fluoroscopy and radiography.

6. When informed that patient is ready, performer checks whether patient has been properly prepared on table,lying on back and appropriately shielded. Performer indicates any needed adjustments. Reassures patient and does so as deemed needed throughout procedure. Explains that performer will ask the patient to cooperate from time to time during procedure, and does so as appropriate.

7. Performer checks that all materials needed for procedure are present. Requests any missing objects. Dons protective lead garments and sterile gown.

8. Performer positions overhead fluoroscope unit over patient; may have

List Elements Fully

lights in room dimmed. Activates fluoroscope or has this done by technologist. Performer adjusts fluoroscope unit or x-ray table until the naso-enteric tube is visible and in position on TV monitor. Turns off fluoroscope.

If fluoroscope has spot film attachment that uses cassettes, performer has cassette inserted. Chooses full, half or quarter format and sets as appropriate. (If roll film attachment, checks that attachment is loaded with film or has this done.)

9. Performer prepares or checks the barium sulfate solution. Draws up into syringe in proper amount. Performer injects contrast solution into intestines through the naso-enteric tube.

10. Performer observes the flow of the contrast solution through the gastrointestinal tract by viewing on the fluoroscope monitor. Judges the amount needed to provide proper definition of the intestinal area and observes the probable area of blockage or obstruction. Injects additional contrast solution as needed.

When adequate contrast has been obtained, performer moves the fluoroscope unit and/or the x-ray table so as to identify, examine and observe the area(s) of suspected pathology. May draw back catheter to provide unobstructed view.

Performer decides what to record as spot films while viewing on monitor. Activates spot film attachment and x-ray foot pedal as appropriate. If cassette attachment, may have technologist remove cassette as spots are snapped and insert additional cassettes, or does so personally.

TASK DESCRIPTION SHEET (continued)

Task Code No. 341

This is page 3 of 3 for this task.

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11. Performer observes patient's reaction to procedure for signs of adverse effects. May decide to provide emergency care.

12. When performer determines that fluoroscopic examination is completed, performer shuts fluoroscope. Decides what radiographs to order and specifies number, positions and views required to technologist. If appropriate, records on requisition sheet.

13. Performer looks at the radiographs and spot films on view boxes as soon as they are processed. Determines whether they are technically adequate to demonstrate the area(s) under study and provide sufficient information to make possible a competent medical interpretation. Performer may ask opinion of clinician or another radiologist.

    a. Performer decides whether to order additional views based on the information already available, the patient's condition and his or her radiologic history.
    b. If the performer decides to order additional views, performer informs technologist, specifying what is needed. May record.
    c. Performer examines additional radiographs as above.

14. When performer has determined that the examination has been completed, indicates to subordinates that procedure can be terminated. Performer may gently remove the naso-enteric catheter. Reassures patient. If appropriate, orders sanitary clean up procedures.

15. Performer records impressions of procedure on patient's chart:

    a. Preliminary findings.
    b. How patient tolerated procedure.

List Elements Fully

    c. Any special nursing follow-up recommended.
    d. May sign chart or requisition sheet.
    e. If requested by ordering physician, performer may report results immediately to MD.

TASK DESCRIPTION SHEET

Task Code No. 342

This is page 1 of 3 for this task.

1. **What is the output of this task? (Be sure this is broad enough to be repeatable.)**

Decision made on doing second day study, fluoroscopic study after oral cholecystography or oral cholangiography; if decided, patient fluoroscoped and spot films taken; decision made on doing post-fatty meal, post-evacuation radiographs and further fluoroscopy; decision made on delayed series of radiographs; medical impressions and follow-up orders recorded; MD notified of emergency signs.

2. **What is used in performing this task? (Note if only certain items must be used. If there is choice, include everything or the kinds of things chosen among.)**

X-ray requisition form and patient's chart; oral cholecystograms or oral cholangiograms; view boxes; fluoroscope, TV monitor, spot film device with cassettes or roll film; pen; telephone; protective lead garments; immobilization devices; shielding

3. **Is there a recipient, respondent or co-worker involved in the task? Yes...(X) No...( )**

4. **If "Yes" to q. 3: Name the kind of recipient, respondent or co-worker involved, with descriptions to indicate the relevant condition; include the kind with whom the performer is not allowed to deal if relevant to knowledge requirements or legal restrictions.**

Any patient to have oral cholecystography; radiologic technologist; referring MD; radiologist; nurse; accompanying adult

5. **Name the task so that the answers to questions 1-4 are reflected. Underline essential words.**

Evaluating oral cholecystograms or oral cholangiograms; conducting fluoroscopy and/or post-fatty meal, post-evacuation study of any non-infant patient involved if so decided by reading and interpreting radiographs, deciding whether to order second day study, do fluoroscopy; if decided, conducting fluoroscopy and taking spot films; deciding whether to order post-fatty meal, post-evacuation radiographs; if decided, evaluating radiographs and/or conducting fluoroscopy; deciding whether to order delayed films; recording medical impressions and orders; notifying MD of emergency signs.

List Elements Fully

Performer receives the oral cholecystograms (study of gall bladder) or oral cholangiograms (study of biliary tract), requisition sheet, and medical information on a patient after films have been taken and processed by a radiologic technologist, after initial, single oral dose of contrast medium or after second day study.

1. Performer reads the patient's requisition form and relevant information to become familiar with the case. Notes reasons and circumstances for ordering the procedure and suspected pathology. Notes patient's age, sex and size. Notes any medically relevant information such as results of lab tests; notes whether patient has an infectious or communicable condition, whether female patient of child bearing age is pregnant or may be pregnant.

2. Performer looks at radiographs on view boxes. May also examine earlier scout film or earlier first day series:

   a. Determines whether the radiographs are technically adequate to demonstrate the area and condition under study and provide sufficient information to make possible a competent medical interpretation.

      Performer notes particularly whether the gall

OK-RP;RR;RR

6. **Check here if this is a master sheet..(X)**

TASK DESCRIPTION SHEET (continued)

Task Code No. 342

This is page 2 of 3 for this task.

List Elements Fully

bladder is visible or overshadowed and whether there are gall stones. Performer may ask opinion of clinician or another radiologist.

b. If performer decides that visualization of gall bladder is poor or nonexistent, performer orders an additional dose of oral contrast for a second day study. May record on requisition sheet. Arranges to have patient rescheduled for next day.

c. When there is visualization of gall bladder, performer decides, based on the information provided on the radiographs, whether the study is adequate or whether to proceed with fluoroscopy and spot filming in order to obtain more information. May record.

3. If the cholecystograms or cholangiograms provide adequate information and no fluoroscopy is required, performer decides whether to have the patient eat or be fed a fatty meal and have post-fatty meal, post-evacuation cholecystograms taken.

a. If no fatty meal is to be ordered, performer terminates procedure.

b. If performer decides that a fatty meal is to be given, performer so orders. Indicates specific diet and time elapse after meal and evacuation, or orders standard diet and standard timing for the procedure, depending on patient's age and institutional arrangements. May record.

4. If the performer has decided to use fluoroscopy, performer has patient and equipment prepared.

a. Greets patient and any accompanying adult. Reassures and explains what is to be done. May rehearse with pediatric patient to allay fears. May ask female of child bearing age whether she may be pregnant.

List Elements Fully

b. Checks whether patient has been properly positioned and shielded. May decide to immobilize pediatric patient personally.

c. Dons protective lead garments. Makes sure that anyone remaining in room is properly shielded.

d. If fluoroscope has spot film attachment that uses cassettes, performer has cassettes inserted. Chooses full, half, or quarter format and sets up as appropriate. (If roll film attachment, checks that attachment is loaded with film or has this done.)

e. Performer positions fluorosocpe unit over patient; may have lights in room dimmed. Activates fluoroscope. Performer adjusts unit or moves position of table until the biliary tract is clearly visible on the TV monitor. May have technologist assist.

Performer moves the table and/or patient or has the patient move to obtain all the views required; observes on the TV monitor.

f. Performer decides the views to record as spot films while observing on monitor. Activates spot film attachment and x-ray foot pedal as appropriate. If cassette attachment, may have technologist remove cassette as spots are snapped and insert additional cassettes, or does so personally.

g. Performer judges when fluoroscopy is completed and shuts fluoroscope.

5. If performer has decided to order post-fatty meal, post-evacuation cholecystograms as described in step 3, may decide to do post-meal and post-evacuation fluoroscopy as well; if so, notifies radiologic technologist.

TASK DESCRIPTION SHEET (continued)

Task Code No. 342

This is page 3 of 3 for this task.

List Elements Fully	List Elements Fully
6. If fatty meal has been ordered and additional fluoroscopy is to be performed, performer is notified when patient has had meal and evacuated and appropriate time has elapsed. Performer proceeds with fluoroscopy and spot filming as described above. 7. Performer views post-fatty meal evacuation radiographs (and spot films if taken) on view boxes as soon as they are ready, and evaluates as described above. Decides whether to order delayed series. If so, writes order on requisition sheet. 8. When performer has determined that the examination has been completed, informs technologist that patient can be sent back home, to floor, or to next procedure. If appropriate has sanitary clean up procedures carried out. 9. If performer judges that any emergency signs are in evidence, or if referring physician has requested it, performer notifies physician of preliminary findings by phone. May discuss. 10. Performer records any orders given. May sign chart or requisition sheet.	

TASK DESCRIPTION SHEET

Task Code No. 343

This is page 1 of 4 for this task.

1. What is the output of this task? (Be sure this is broad enough to be repeatable.)

Decision made on whether to go ahead; entry site selected; patient anesthetized; puncture needle with teflon sheath inserted into bile duct under fluoroscopy; drainage tube attached; contrast solution injected; radiographs ordered; fluoroscopy done and spot films taken; complete set of cholangiograms approved; drainage tube reinforced or removed; medical impressions and follow-up orders recorded.

2. What is used in performing this task? (Note if only certain items must be used. If there is choice, include everything or the kinds of things chosen among.)

X-ray requisition form,pt.'s radiographic materials; pen;scout film;view boxes;antiseptic solution; swabs; sterile towels; sterile syringes and needles; iodine based aqueous contrast solution; local anesthetic; tape; scissors: teflon puncture needle; drainage tube and receptacle;gauze;bandage;fluoroscope; TV monitor; spot film device with cassettes or roll film; pen; phone; protective lead garments; sterile gown; gloves

3. Is there a recipient, respondent or co-worker involved in the task? Yes...(X) No...( )

4. If "Yes" to q. 3: Name the kind of recipient, respondent or co-worker involved, with descriptions to indicate the relevant condition; include the kind with whom the performer is not allowed to deal if relevant to knowledge requirements or legal restrictions.

Any non-pediatric patient to have percutaneous cholangiography; radiologic technologist; referring physician; surgeon; nursing personnel

5. Name the task so that the answers to questions 1-4 are reflected. Underline essential words.

Conducting percutaneous (transhepatic) cholangiography of any non-pediatric patient by deciding whether to go ahead; reassuring patient; deciding on site of entry; injecting anesthetic; inserting teflon puncture needle into bile duct using fluoroscopy; checking for correct entry; attaching drainage tube to sheath in duct; injecting iodine based aqueous contrast solution through tube; ordering radiographs; conducting fluoroscopy and taking spot films; deciding when examination is completed by viewing cholangiograms; deciding whether to leave drainage tube in place and removing or reinforcing; recording medical impressions and/or discussing with surgeon; ordering follow up care.

List Elements Fully

Performer recieves the x-ray requisition form and medical information on a patient scheduled for percutaneous cholangiography (transhepatic cholangiography) (radiography of the biliary tract after injection of contrast medium by means of a puncture procedure);patient will already have been judged able to undergo the surgery which might be indicated by this examination.

1. Performer reads the patient's requisition form and relevant medical information to become familiar with the case or to review material seen earlier. Performer notes where the pathology, stone, or mass is suspected and whether any special requests for radiography have been made.

2. Performer reviews any current radiographs to become familiar with evidence on the location of the pathological condition or blockage. Examines radiographs on view boxes. Notes any orders on pre-examination procedures and checks whether these have been followed. Notes any recommendations on technique such as site of entry. Notes records on how patient tolerated any previous procedures; notes whether patient has history of allergy to contrast medium,may be pregnant (if female),has an infectious or communicable condition and other relevant medical information.

   Checks to see that patient has signed consent for procedure.

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6. Check here if this is a master sheet..(X)

TASK DESCRIPTION SHEET (continued)

Task Code No. 343

This is page 2 of 4 for this task.

List Elements Fully

If not, informs appropriate co-worker; terminates examination or delays until written consent is obtained.

3. Performer greets patient in examination room. Attempts to reassure patient and explains what will be done. Answers questions. Performer examines patient and notes relevant symptoms and body structure. May palpate abdominal area to feel size, condition, and location of liver. Checks whether female patient may be pregnant.

4. Performer decides whether there are contraindications to going ahead with the procedure. May have clinician or specialist called; discusses patient's current condition and any alternative steps. Performer decides whether to proceed or not based on evaluation of patient's condition and contraindications.

   If performer decides not to proceed, records reasons and any recommendations on patient's chart. Informs appropriate co-worker of cancellation and has patient returned to room. If appropriate, orders rescheduling of patient or scheduling for alternative procedure.

5. If performer decides to proceed, makes final decisions on technique and site of entry based on requisition sheet, chart and own examination. If appropriate, writes decision on requisition sheet and informs appropriate co-workers so that patient, materials and technical factors for fluoroscopy can be prepared or set.

6. Performer orders a scout film and examines on view box when ready:

   a. Performer considers whether the biliary tract is visible, whether the technique is satisfactory, whether the position of the patient is correct, and whether the view needed is obscured in any way.
   b. If the scout is not satisfactory, performer indicates the needed changes in technique or in the patient's position.

List Elements Fully

7. Performer has the patient prepared for insertion of the puncture needle into one of the biliary ducts or other site in the biliary tract, as decided.

   a. When informed that patient is ready, performer checks whether patient has been properly prepared and site of injection exposed. If not acceptable, performer indicates the needed adjustments.
   b. Reassures patient and does so as deemed necessary throughout procedure. Explains that performer will ask the patient to hold still from time to time during procedure, and does so as appropriate.
   c. Performer checks that all materials needed for procedure are present and that anyone remaining in room is shielded.

8. Performer prepares patient for anesthetic. Dons protective lead garments and sterile gown and gloves. Swabs area of injection site with antiseptic solution. Covers surrounding areas with sterile towels.

9. Checks amount of local anesthetic to be injected as shown by nurse; draws anesthetic into sterile syringe. Expels air; inserts needle and injects anesthetic. Removes needle and swabs area with sterile solution. Waits for area to become anesthetized.

10. Performer fills another syringe with the iodine based, aqueous contrast solution selected, checking that quan-

TASK DESCRIPTION SHEET (continued)

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This is page 3 of 4 for this task.

List Elements Fully

tity is correct; or checks prepared syringe. Lays on tray.

11. Performer positions overhead fluoroscope unit over patient; may have lights in room dimmed. Activates fluoroscope or has this done by technologist. Performer adjusts unit until the liver is visible on the TV monitor. May indicate needed adjustment in technical factors to technologist. May reposition patient.

12. When the technical quality of the TV image is judged adequate, performer positions the 18 gauge puncture needle (equipped with stylet and teflon sheath) over the entry site by viewing location of needle on the monitor. When performer considers the needle to be at correct entry site, performer adjusts it to the proper angle for entry. (May use sponge stick or towel clip to avoid placing hands directly in path of radiation beam.)

13. Performer asks patient to hold breath and attempts to penetrate the biliary duct, checking on TV monitor.

14. When performer considers that the biliary duct has been entered (not based on visualization because duct cannot be seen), performer checks for presence of bile:

    a. Performer withdraws outer part of needle leaving teflon sheath in place. Attaches empty syringe to teflon sheath.
    b. Performer aspirates syringe to draw out bile from duct.
    c. If performer observes blood or no bile in syringe, performer pulls back teflon sheath one-to-two mm.'s and repeats attempt to obtain bile. Notes amount withdrawn. If performer does not obtain bile, may repeat or decide to test entry using contrast medium. Removes syringe; wipes off blood and/or bile.

List Elements Fully

    d. If performer did not obtain bile spontaneously, performer uses the syringe containing the contrast medium to inject a small test amount of the contrast medium into the duct through the sheath. Checks on the TV monitor to be sure that the sheath is lying within the duct. Notes whether the contrast medium outlines the ductal structure to have been entered. Removes syringe; wipes off blood.
    e. If performer decides that proper entry has not been accomplished, repeats procedure as appropriate until satisfied. May select another entry site and repeat until sure of proper entry.

15. When performer judges that the sheath has been properly inserted in the biliary duct, shuts fluoroscope. Performer attaches a drainage tube to the teflon sheath and allows the bile to drain through it into an appropriate receptacle. May tape sheath into position to prevent movement.

16. Performer injects the contrast medium in the appropriate dosage based on standard amount and/or bile withdrawn.

    a. Performer injects through the drainage tube attached to the teflon sheath, using the syringe with the contrast solution. Notes passage of contrast on TV monitor.
    b. Performer orders radiographs. May specify number and positions or refers to standard procedure.

17. Performer may decide to observe the area in motion using fluoroscopy:

    a. If fluoroscope has spot film attachment that uses cassettes, performer has cassette inserted.

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This is page 4 of 4 for this task.

List Elements Fully

Chooses full, half, or quarter format and sets up as appropriate. (If roll film attachment, checks that attachment is loaded with film or has this done.)

b. Activates fluoroscope. Performer adjusts fluoroscope unit or moves position of table until the area being observed is clear. Performer notes where there is blockage, obstruction, or signs of pathology. May examine other areas of the biliary tract.

c. Performer decides what to record as spot films while viewing on monitor. Activates spot film attachment and x-ray foot pedal as appropriate. If cassette attachment, may have technologist remove cassette as spots are snapped and insert additional cassettes, or does so personally.

18. Performer observes patient for signs of adverse reaction to procedure. May decide to provide emergency care.

19. Performer looks at radiographs and spot films, in order, on view boxes as they are processed:

a. Determines whether the cholangiograms are technically adequate to demonstrate the area and condition under study and provide sufficient information to make possible a competent medical interpretation. If appropriate, asks for change in technical factors.

b. If appropriate, performer consults with surgeon on interpretation of radiographs and advisability of surgery.

c. Performer decides whether it would be desirable to inject more contrast, and/or whether another location should be entered and injected, based on the information already available on the cholangiograms, the way in which the patient tolerated the procedure, and the patient's condition and cumulative exposure. If the performer decides to reinject in same location or another site, repeats relevant steps for procedure in appropriate location chosen until satisfied, as described above.

d. When performer has determined that the examination has been completed, informs technologist.

20. Performer returns to patient and reassures. May examine whether sheath is firmly lodged or not. Performer decides whether to leave sheath and drainage tube in place to facilitate bile drainage, prevent leakage, and help decompress ductal tract, or whether to remove. (Leaves if patient is to enter surgery at once.)

a. If performer decides to remove sheath, performer reassures patient. Removes drainage tube and has patient hold still while performer gently removes the teflon sheath. Swabs area. Decides on sterile dressing and orders, or applies personally.

b. If performer decides to leave sheath and drainage tube in place, performer may secure with additional adhesive tape.

21. Performer records impressions of procedure on patient's chart:

a. Preliminary findings.

b. How patient tolerated procedure.

c. Any special nursing follow-up recommended.

d. May sign chart or requisition sheet.

TASK DESCRIPTION SHEET

Task Code No. 344

This is page 1 of 5 for this task.

1. What is the output of this task? (Be sure this is broad enough to be repeatable.)

Decision on whether to go ahead with IVC; test dose of contrast medium injected; patient's reaction evaluated; emergency care administered; full dose of contrast solution infused if decided; orders given on time sequence and views for IVC's; IVC's evaluated; decisions made on orders for gallbladder series, tomograms, post-fatty meal, post-evacuation films; full set of radiographs approved; medical impressions, recommendations on follow-up care, and orders for delayed series recorded.

2. What is used in performing this task? (Note if only certain items must be used. If there is choice, include everything or the kinds of things chosen among.)

X-ray requisition form and patient's chart; scout film; view boxes; prepared procedure tray with materials needed for test dose, glucose, sterile water and iodine based contrast solution, materials for IV infusion; materials and equipment on emergency cart; telephone; pen; watch or clock; immobilization devices; shielding

3. Is there a recipient, respondent or co-worker involved in the task? Yes...(x) No...( )

4. If "Yes" to q. 3: Name the kind of recipient, respondent or co-worker involved, with descriptions to indicate the relevant condition; include the kind with whom the performer is not allowed to deal if relevant to knowledge requirements or legal restrictions.

Any pt. to have IVC examination;referring MD;attending clinicians,radiologists;radiologic technologist; nurse or clerk; accompanying adult

5. Name the task so that the answers to questions 1-4 are reflected. Underline essential words.

Conducting intravenous cholangiography and cholecystography (IVC) of any non-infant patient by checking scout film and interviewing patient; if appropriate, injecting test dose of iodine based contrast medium, observing reactions, and deciding whether to proceed; administering full dosage and/or providing emergency care; ordering time sequence cholangiograms; ordering, as decided, tomograms; cholecystograms, post-fatty meal, post-evacuation cholecystograms; deciding when examination is complete by viewing radiographs; recording medical impressions, follow-up care and orders for delayed series.

List Elements Fully

Performer receives the x-ray requisition form and medical information on a patient scheduled for intravenous cholangiography (IVC or IVGB) (radiography of the biliary tract using contrast medium that is introduced through a vein).

1. Performer reads the patient's requisition form and relevant information to become familiar with the case or to review materials seen earlier (in consultation). Notes reasons for ordering the procedure and suspected conditions. Notes patient's age, sex and size.
    a. Performer notes whether patient has undergone prior lab tests and radiography such as oral cholecystography, or whether examination is initial study (such as when patient has no gallbladder). Performer views any current radiographs on view box and reviews results of other tests. Notes whether patient has undergone allergy test for contrast medium and, if so, reactions.
    b. Performer notes orders on pre-examination procedures, comments from referring physician, whether patient has an infectious or communicable condition and any other relevant medical information. Notes whether female patient may be pregnant.

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6. Check here if this is a master sheet..(x)

TASK DESCRIPTION SHEET (continued)

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This is page 2 of 5 for this task.

List Elements Fully

c. Performer checks to see whether patient has followed pre-examination regimen. If not, has patient rescheduled.

d. Checks to see that patient or authorized adult has signed consent for procedure. If not, informs appropriate co-worker and either terminates examination or has it delayed until written consent is obtained.

2. Unless scout film is ready on view box, performer orders scout film and examines on view box when ready:

   a. Performer considers whether the scout film adequately demonstrates the area under study. If not, indicates changes needed in technical factors or patient positioning to technologist, or records on requisition sheet.

   b. Performer notes whether gas, feces, or barium traces (from earlier studies) obstruct view and must be cleared before procedure can be done. If so, performer writes what is needed on requisition form and has patient rescheduled.

3. Performer greets patient and/or accompanying adult in examination room. Attempts to reassure and explains what will be done. Performer may question adult and/or patient about symptoms in relation to the condition being studied. May collect additional medical history regarding previous operations, radiography, allergies (especially to iodine and seafood), respiratory problems or asthma. Checks whether female patient is pregnant or thinks she may be. Answers patient's questions. May demonstrate and rehearse procedure with pediatric patient to gain confidence and allay fears.

List Elements Fully

4. Performer considers whether there are contraindications to going ahead with the procedure. May have clinician called to discuss patient's current condition and further steps.

   If performer decides not to proceed, records reasons and any recommendations on patient's chart. Informs appropriate co-worker of cancellation and has patient returned to room. If appropriate, orders rescheduling of patient or scheduling for alternative procedure.

5. If performer decides to proceed, performer indicates to appropriate staff person whether an allergy test will be performed (if not already done). Performer administers test dose of contrast solution (to check reaction to iodine based medium):

   a. Performer has patient prepared; checks that procedure tray and emergency cart are present and properly equipped. Explains to patient or adult what is to occur.

   b. Performer may prepare patient personally by exposing arm, applying tourniquet, finding vein, and swabbing site with antiseptic solution, or has this done. May decide to immobilize pediatric patient.

   c. Performer asks for or selects prepared test dose of radiopaque iodine-based contrast solution (such as Cholografin) in hypodermic; checks for proper amount for patient's size;expels air in syringe. Performer inserts needle into vein. Removes tourniquet and injects test dose. Removes needle and swabs site.

      Performer may inject a test amount from prepared dose and tape needle in place.

TASK DESCRIPTION SHEET (continued)

Task Code No. 344

This is page 3 of 5 for this task.

List Elements Fully

d. Performer observes patient's reactions to test dose for several minutes to decide whether to proceed with full dosage of contrast solution for IVC.

6. If patient has a severe reaction to the test dose, such as cardiac arrest, anaphylactic shock (exaggerated negative reaction to the foreign substance), bronchospasm or laryngospasm (stricture of bronchial tubes or larynx), hypotension (drop in blood pressure), cyanosis (bluish discoloration due to excessive concentration of reduced hemoglobin in blood), urticaria (vascular skin reaction), or violent sneezing, performer proceeds at once with emergency life support or measures to control the reaction:

   a. Performer determines the severity of the condition by listening for heartbeat, respiration; may check blood pressure; may take EKG reading, using equipment on emergency cart.
   b. Depending on the symptoms, performer may carry out any or all of the following emergency procedures using equipment on emergency cart:

      i) May administer oxygen or air using oxygen tank and mask or ambu bag; may clear airway using finger or tongue blade.
      ii) May decide to establish an airway by removing any dentures and, using a laryngoscope (to view larynx) inserting an endotracheal tube. May perform tracheostomy by cutting opening into trachea and inserting a tube.
      iii) May apply closed chest cardiac massage.
      iv) Depending on EKG results may apply defibrillator by selecting watt seconds, applying, and raising watt seconds until effective.

List Elements Fully

      v) Depending on EKG results may administer a prepared intracardial injection of a heart stimulant.
      vi) May decide on and administer IV infusion.
      vii) When patient has been revived, performer records reaction to test dose and what was done on patient's chart. Notifies appropriate medical staff; orders aftercare as appropriate; has patient transported to appropriate location.
      viii) Terminates procedure by notifying appropriate staff.

   c. If performer judges that patient displays a strong (but not emergency) allergic reaction:

      i) Performer may order and administer a cortico-steroid or an antihistamine.
      ii) Performer decides whether the reaction is sufficiently controlled to proceed with the full dosage.
      iii) If performer decides to terminate, performer records details of test on patient's chart and requisition form. Explains to patient or any appropriate adult that patient is allergic to the contrast solution (i.e. iodine-based solution). Terminates procedure by notifying appropriate staff.

7. If performer decides to proceed with full dosage of the contrast solution, performer makes sure that materials are present for IV infusion.

   a. Performer checks prepared IV bottle containing 125cc of: Cholografin (20cc), sterile water (100cc) and

TASK DESCRIPTION SHEET (continued)

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This is page 4 of 5 for this task.

List Elements Fully

glucose (5cc), or prepares personally in proper pediatric amount.

b. Sets up IV infusion apparatus near patient. Attaches bottle of prepared contrast solution to sterile IV tubing. Hangs at appropriate height on pole near patient with clamp in closed position.

c. Prepares patient for insertion of IV needle by exposing vein selected, applying tourniquet, and swabbing site with antiseptic solution. Inserts IV needle with sterile loop attached. Removes tourniquet. Tapes needle into position. May immobilize limb.

d. Runs fluid through tubing to check flow and remove air. Attaches loop of needle to IV tubing. Adjusts flow in tube to desired rate and starts infusion. Checks on patient while infusion is in process.

e. Performer notes time so that proper sequence of radiography can be carried out.

f. Performer observes patient for signs of severe reaction to the full dose of contrast solution. If there is a severe reaction, performer proceeds, as described above, with emergency care.

8. Performer decides when the proper time (20 minutes) has elapsed to start the examination. Removes IV apparatus or has it removed.

Performer orders overhead cholangiograms. Specifies to technologist the intervals at which the radiographs will be taken and the positions desired, or refers to standard series. (Periods are 20, 40, 60 and 90 minutes and then 2, 3 and 4 hours). Has radiographs marked for times taken. Makes sure anyone remaining with pediatric patient is properly shielded.

List Elements Fully

9. Performer looks at each series of radiographs on view boxes, in order, as soon as they are processed:

a. Determines whether the radiographs are technically adequate to demonstrate the area and condition under study and provide sufficient information to make possible a competent medical interpretation.

b. Performer observes whether the time-density displays abnormal signs.

10. When performer determines that the common bile duct has been adequately defined, and, if the patient has a gallbladder, performer orders standard cholocystograms (gallbladder series).

Performer may also arrange for tomography as follows:

a. Estimates the probable depth and level of the area to be studied based on the radiographs already seen. Indicates to technologist depth, levels and intervening distances for "cuts" for the first series.

b. Performer views first series of tomograms on view boxes as they are processed. Judges levels within which the common bile duct is best localized visually.

c. Performer then selects the level, depth and intervening distances at which the final "cuts" should be made with the patient in appropriate positions.

11. Performer views the tomograms and the cholocystograms when they are processed:

a. Performer evaluates radiographs for technical adequacy. May reorder certain views or ask for ad-

TASK DESCRIPTION SHEET (continued)

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This is page 5 of 5 for this task.

List Elements Fully	List Elements Fully
ditional views if needed, and reviews these when processed. b. Performer evaluates the medical information on the radiographs and decides whether additional information from post-fatty meal, post-evacuation cholocystograms would assist in making a competant medical interpretation (only if patient's gallbladder has been visualized and if there is no evidence of gall stones). c. If performer decides to order post-fatty meal evacuant films, indicates this to appropriate staff. Orders standard procedure or specifies food and time elapses after food intake and evacuation. May record. 12. Performer views post-fatty meal evacuation radiographs on view boxes as soon as they are ready and evaluates as described above. Decides whether to order delayed series of common bile duct and/or gall bladder. If so, writes order on requisition sheet. 13. When performer has determined that the examination has been completed, informs technologist that patient can be sent back home, to floor, or to next procedure. Orders appropriate clean up procedures. 14. If performer judges that any emergency signs are in evidence, or if referring physician has requested it, performer notifies physician of preliminary findings by phone. May discuss. 15. Performer records impressions of procedure on patient's chart: a. Preliminary findings. b. How patient tolerated procedure. c. Any special nursing follow-up recommended or delayed series ordered. d. May sign chart or requisition sheet.	

TASK DESCRIPTION SHEET

Task Code No. 345

This is page 1 of 3 for this task.

1. What is the output of this task? (Be sure this is broad enough to be repeatable.)

Decision made on whether to go ahead with T-tube cholangiography; patient reassured; contrast solution injected; fluoroscopy done; spot films taken; overhead radiographs ordered; complete set of cholangiograms approved; medical impressions and follow-up orders recorded.

2. What is used in performing this task? (Note if only certain items must be used. If there is choice, include everything or the kinds of things chosen among.)

X-ray requisition form; patient's radiographic materials; pen; scout films; view boxes; sterile tray with syringe and needle, iodine based contrast solution; fluoroscope unit; spot film device with cassettes or roll film; TV monitor; protective lead garments; T-tube (inserted in patient), clamp and plastic bag; emergency cart; sterile gown, gloves

3. Is there a recipient, respondent or co-worker involved in the task? Yes...(X) No...( )

4. If "Yes" to q. 3: Name the kind of recipient, respondent or co-worker involved, with descriptions to indicate the relevant condition; include the kind with whom the performer is not allowed to deal if relevant to knowledge requirements or legal restrictions.

Any pt. with T-tube previously inserted in common bile duct;radiologic technologist;referring MD;radiologist;nursing personnel;accompanying adult;surgeon

5. Name the task so that the answers to questions 1-4 are reflected. Underline essential words.

Conducting T-tube cholangiography of any patient by deciding whether to go ahead; reassuring patient; injecting iodine based contrast solution into common bile duct through T-tube; fluoroscoping and taking spot films; ordering radiographs; deciding when examination is completed by viewing cholangiograms; recording medical impressions and ordering follow-up care.

List Elements Fully

Performer receives the x-ray requisition form and medical information on a patient scheduled for T-tube cholangiography (post-operative radiography of T-tube which has been inserted in common bile duct during surgery, usually after removal of gall bladder, for bile drainage).

1. Performer reads the patient's requisition form and relevant medical information to become familiar with the case or to review material seen earlier.
    a. Performer reads report on surgery and information on patient's current condition. Notes special requests by referring physician. Checks whether any pre-examination regimen has been ordered and carried out.
    b. Performer notes whether the patient has any history of allergic reaction to contrast medium.
    c. Notes history of prior radiologic studies. Examines current radiographs on view boxes.

2. Performer greets patient and any accompanying adult in examination room. Attempts to reassure. Explains what will be done. Answers questions. Performer examines patient and notes relevant symptoms. If anyone is to remain in examination room,makes sure he or she is properly shielded.

OK-RP;RR;RR

6. Check here if this is a master sheet..(X)

TASK DESCRIPTION SHEET (continued)

Task Code No. 345

This is page 2 of 3 for this task.

List Elements Fully

List Elements Fully

3. Performer orders a scout film and reads on view box when ready:

   a. Performer considers whether the biliary tract is visible, whether the technique is satisfactory, whether the position of the patient is correct, and whether the view needed is obscured in any way.
   b. If the scout is not satisfactory, performer indicates the changes in technique needed, changes in the patient's position or need to have obstructing gas or feces cleared.

4. Performer decides whether there are contraindications to going ahead with the procedure. May have clinician or surgeon called; discusses patient's current condition and any alternative steps.

   a. If performer decides not to proceed, records reasons and any recommendations on patient's chart. Informs appropriate co-worker of cancellation and has patient returned to room. If appropriate, orders rescheduling of patient or scheduling for alternative procedure.
   b. If performer decides to proceed, informs appropriate co-workers so that patient, materials, and technical factors for fluoroscopy can be prepared or set.

5. When informed that patient is ready, performer checks whether patient has been properly prepared. If not acceptable, performer indicates the needed adjustments. Reassures patient and does so as deemed necessary throughout procedure:

   a. Checks that patient has been properly shielded, positioned and immobilized.
   b. Checks that all materials needed for procedure and emergency cart are present. Requests any missing objects.
   c. Performer dons protective lead garments; positions fluoroscope unit over patient; may have lights in room dimmed. Activates fluoroscope. Performer adjusts unit until area of the biliary tract is visible on the TV monitor. May indicate needed adjustment in technical factors to technologist. May reposition patient.
   d. If fluoroscope has spot film attachment that uses cassettes, performer has cassette inserted. Chooses full, half or quarter format and sets up as appropriate. (With roll film device checks that attachment is loaded with film or has this done.)

6. Performer prepares to inject the contrast medium through the T-tube into the common bile duct:

   a. Performer removes the plastic bag attached to the end of the T-tube which protrudes from the patient's abdomen.
   b. Performer checks the prepared iodine based contrast solution. Inserts sterile syringe and draws up solution in proper amount.
   c. Performer opens clamp of T-tube and inserts needle of syringe. Injects contrast medium through syringe into T-tube. Withdraws needle and clamps T-tube unless filling will be fractional.

7. Performer activates fluoroscope and observes the biliary ducts on the TV monitor. Performer notes whether there is evidence of remaining blockage or stones or other signs of pathology. Moves the patient into appropriate positions.

   a. Performer may carry out procedure by injecting contrast medium in

TASK DESCRIPTION SHEET (continued)

Task Code No. 345

This is page 3 of 3 for this task.

List Elements Fully

intervals and observing the area under study. May order overhead radiographs periodically.

- b. Throughout the fluoroscopic observation, as the filling occurs, performer decides what to record as spot films while viewing on monitor. Activates spot film attachment and x-ray foot pedal as appropriate. If cassette attachment, may have technologist remove cassette as spots are snapped and insert additional cassettes, or does so personally.
- c. Notes patient's reaction; may decide to provide emergency care.

8. When performer decides that enough contrast has been administered and fluoroscopy and spot filming is completed, performer clamps T-tube and attaches clear plastic bag. May order overhead radiographs. If so, specifies what is needed.

9. Performer looks at radiographs and spot films on view boxes as they are processed:

   - a. Determines whether the cholangiograms are technically adequate to demonstrate the area and condition under study and provide sufficient information to make possible a competent medical interpretation. Performer may ask opinion of clinician or another radiologist.
   - b. Performer decides whether to take or order additional views, inject more contrast, and/or repeat filming. For pediatric patients decides to do this only in extreme circumstances. In all cases considers information available and patient's condition and radiologic history. Indicates what is needed. May record. Repeats relevant steps as described above.
   - c. Performer decides when the examination has been completed and informs staff. Has appropriate sanitary clean up procedures carried out.

List Elements Fully

10. Performer records impressions of procedure on patient's chart:

   - a. Preliminary findings.
   - b. How patient tolerated procedure.
   - c. Any special nursing follow-up recommended.
   - d. May sign chart or requisition sheet.

TASK DESCRIPTION SHEET

Task Code No. 346

This is page 1 of 2 for this task.

1. What is the output of this task? (Be sure this is broad enough to be repeatable.)

Radiographs of gastrointestinal and/or biliary tracts read, interpreted; conclusions drawn and recommendations made orally or dictated; physician called about emergency signs; selected radiographs earmarked for study or library use; material rejacketed and report placed for typing.

2. What is used in performing this task? (Note if only certain items must be used. If there is choice, include everything or the kinds of things chosen among.)

X-ray requisition forms; current radiographs; view boxes, earlier radiographic materials; telephone, dictation equipment; pen; magnifying glass; cine projector; screen

3. Is there a recipient, respondent or co-worker involved in the task? Yes...(X) No...( )

4. If "Yes" to q. 3: Name the kind of recipient, respondent or co-worker involved, with descriptions to indicate the relevant conditions; include the kind with whom the performer is not allowed to deal if relevant to knowledge requirements or legal restrictions.

Co-workers; clinicians; ordering physician

5. Name the task so that the answers to questions 1-4 are reflected. Underline essential words.

Reading, interpreting and making recommendations on radiographs of gastrointestinal and/or biliary tracts, or giving opinions to co-workers by reviewing medical information and requisition sheet(s), evaluating new and old films; notifying ordering physician of emergency signs; explaining opinions or dictating findings and recommendations; placing report for typing.

List Elements Fully

Performer reads and interprets completed radiographs of gastrointestinal and biliary examinations, or provides opinions to co-workers, when requested, on interpretation and conclusions regarding radiographs involved in the gastrointestinal and biliary studies they are doing.

1. If responding to request, performer goes to where radiographic material is on view. Listens while co-worker explains problem on how to proceed next or problem of interpretation.

   If reading and interpreting own completed work, performer obtains the jacketed radiographic work-ups. Includes the current set of radiographs, tomograms, cine film and projector, the relevant requisition sheets, and earlier films if available. Goes to reading area.

2. Asks about, reads, or reviews x-ray requisition forms and materials on patient's medical history (reason for request, decisions made on technique, comments from ordering physician or consulting physician, notes made during the procedure and interpretations made of procedures already completed).

   a. If reading and interpreting own work, places relevant radiographs on view box, including earlier films.

OK-RP;RR;RR

6. Check here if this is a master sheet..(X)

TASK DESCRIPTION SHEET (continued)

Task Code No. 346

This is page 2 of 2 for this task.

List Elements Fully

b. If responding to request, may ask to see earlier films.

c. Has cine or videotape projected on screen or does this personally.

3. Performer reads and interprets the radiographic materials:

   a. Decides whether any abnormalities, changes, or suspicious signs warrant the immediate attention of the patient's physician. If so, telephones physician at once and discusses findings (or recommends that co-worker in charge of case do this).

   b. For own work, decides what to report and what recommendations to make. May ask opinion of co-worker or clinician.

   c. In response to request, decides what to recommend to co-worker. Explains interpretation and recommendations verbally, indicating how conclusions were arrived at, including medical and technical considerations.

4. Performer dictates findings (for own work) by explaining what appears on the films. Describes worrisome or suspicious signs, obvious abnormalities and/or changes over time, referring to earlier films. (Might indicate presence of artifacts which do not have medical significance.)

   Indicates what implications can be drawn from findings and what conclusions and/or courses of action are warranted, including need for additional studies, tests, or courses of treatment.

   Dictates report in the style: There is ...on.... It has the characteristics of .... I believe that this indicates.... This could mean that.... It is necessary to determine whether.... This can be done by....

List Elements Fully

5. May decide whether any of the material is unusual or of special interest and warrants inclusion in museum library, or should be used for study purposes. Marks jackets appropriately if so decided.

6. Returns own patient's radiographic material, requisition sheet and tape of dictation to proper jacket, and places to be picked up for typing.

TASK DESCRIPTION SHEET

Task Code No. 347

This is page 1 of 2 for this task.

1. What is the output of this task? (Be sure this is broad enough to be repeatable.)

Radiology resident shown and explained procedures involved with radiography of gastrointestinal and biliary tracts; resident evaluated for readiness to do activities under supervision; resident observed and criticized; resident evaluated for readiness to do tasks without direct supervision; resident's work spot checked and criticized; questions answered; opinions on work given as requested; evaluation noted informally.

2. What is used in performing this task? (Note if only certain items must be used. If there is choice, include everything or the kinds of things chosen among.)

X-ray requisition forms; materials and equipment needed for radiographic studies of gastrointestinal and biliary tracts; related radiographs; view boxes; emergency equipment

3. Is there a recipient, respondent or co-worker involved in the task? Yes...(X) No...( )

4. If "Yes" to q. 3: Name the kind of recipient, respondent or co-worker involved, with descriptions to indicate the relevant condition; include the kind with whom the performer is not allowed to deal if relevant to knowledge requirements or legal restrictions.

Radiology resident to be instructed in gastrointestinal and biliary tract radiography; any pt. involved;surgeons;clinicians;supervisor of residents

5. Name the task so that the answers to questions 1-4 are reflected. Underline essential words.

Providing clinical training for radiology residents in radiographic study of the gastrointestinal and biliary tracts by demonstrating procedures, explaining what is being done, answering questions; deciding when residents can perform tasks under direct supervision; observing and correcting; deciding when tasks can be done without direct supervision; spot checking and correcting; advising as requested or as deemed necessary.

List Elements Fully

Performer provides clinical training to residents in radiology in the area of the gastrointestinal and biliary tracts, covering choice of examinations, medical aspects of procedures, interpretation of radiographic material, and possible recommendations and treatments.

1. Performer provides demonstration, explanation, informal evaluation and supervision in: reading requests for radiographic studies and deciding on best procedure; what to look for; available medical and technical procedures including anesthetics, surgical entry, use of contrast media, technical equipment, positions and angles, contraindications, allergy tests; emergency care; providing technical and medical interpretation of radiographic materials; learning range of medical conclusions that can be drawn; alternative, and additional tests; and courses of treatment to consider.

2. When performer is assigned a resident, may select times, patients, and procedures to demonstrate, and may explain to resident while performer carries out own tasks.
   a. Performer explains what will be taught.
   b. Performer may narrate the steps, may explain what is being done, or may explain the basis for decisions and actions.

OK-RP;RR;RR

6. Check here if this is a master sheet..(X)

TASK DESCRIPTION SHEET (continued)

Task Code No. 347

This is page 2 of 2 for this task.

List Elements Fully

c. Performer may decide to solicit questions to find out what the resident understands, may answer questions, or may elaborate on the explanation of what is being done, concentrating on the relevant skills and knowledges.

d. Performer decides when the resident has observed sufficiently and has a clear enough understanding of a procedure to carry it out under close, direct supervision and/or to assist.

3. Performer supervises and observes resident carrying out activities assigned.

   a. Performer asks the resident to do all or part of a procedure and remains at the side of the patient or carries out own portion and watches the resident perform the assigned activity.
   b. While observing, performer decides whether the activity is being done properly, whether there is a specific problem, whether there is need to demonstrate the procedure again or explain, and does so.
   c. Performer may comment on the performance, encourage or correct as deemed necessary, or do this later.
   d. Performer may decide to intervene and take over the procedure, explaining to the resident what was done incorrectly at that point or later.
   e. If decision is to demonstrate again, performer may redo and have the resident observe, or have resident repeat the procedure until it is done properly.
   f. Performer decides which procedures or activities can be done by the resident without direct supervision (although radiologist remains responsible). Informs proper supervisors, notes for own use, and/or tells this to resident.

List Elements Fully

4. Performer spot checks resident carrying out activities without direct supervision or responds to requests for guidance, assistance, or further instruction.

   Performer proceeds as in steps 2 or 3 as appropriate, observing, noting areas needing improvement, determining nature of problem, assisting, giving opinions, answering questions, and providing further instruction on how to deal with unusual circumstances. Reinforces correct work. Suggests areas for improvement.

5. When patients are present for demonstrations, performer may explain presence of resident; when observing, performer may explain own presence.

6. Performer informally notes the extent of learning or proficiency of resident throughout the training:

   a. May decide to discuss performance with resident at any time.
   b. Does not keep formal records on what was taught, or on resident's progress.
   c. May make personal notes for use in later evaluation meetings.

TASK DESCRIPTION SHEET

Task Code No. 348

This is page 1 of 2 for this task.

1. What is the output of this task? (Be sure this is broad enough to be repeatable.)

Outline and content planned and prepared for lecture to residents or case conference on gastrointestinal and biliary tract; lecture given; conference conducted by use of questions and answers.

2. What is used in performing this task? (Note if only certain items must be used. If there is choice, include everything or the kinds of things chosen among.)

Paper, pen; instructional and reading material in gastrointestinal tract radiology; radiographic materials; projector and slides; cine and projector and/or videotapes and player; screen; view boxes

3. Is there a recipient, respondent or co-worker involved in the task? Yes...(X) No...( )

4. If "Yes" to q. 3: Name the kind of recipient, respondent or co-worker involved, with descriptions to indicate the relevant condition; include the kind with whom the performer is not allowed to deal if relevant to knowledge requirements or legal restrictions.

Residents in radiology; program director; co-worker; library and/or clerical personnel

5. Name the task so that the answers to questions 1-4 are reflected. Underline essential words.

Planning and presenting lectures or case conferences on gastrointestinal and biliary tract radiology for radiology residents by deciding on content, method of presentation; preparing material; presenting lecture, being aware of responses and adjusting presentation to students' needs; using radiographic material in question and answer format to demonstrate aspects of topics for instructional purposes.

List Elements Fully

Performer presents lecture(s) or holds case conferences on gastrointestinal and biliary tract radiology for classes of radiology residents.

1. Performer is notified of assignment or decides what should be covered and at what depth and degree of detail, considering the residents' current academic level and objectives of the residency program.

2. Decides on method of presentation and plans lecture and/or case conference:

   a. Prepares outline.
   b. May obtain special instructional materials or asks co-worker to obtain for review. May use materials already prepared.
   c. May do research in topic area for use in lecture.
   d. May prepare slides from own source of radiographs (teaching cases) or may obtain existing radiographic material and slides from library. May ask co-worker to obtain for review, or personally chooses radiographs to illustrate problem cases for a question and answer session. Performer may choose materials to contrast normal and pathological states.
   e. Decides on time to allocate for questions and answers for lecture, or may choose residents to pre-

OK-RP;RR;RR

6. Check here if this is a master sheet..(X)

TASK DESCRIPTION SHEET (continued)

Task Code No. 348

This is page 2 of 2 for this task.

List Elements Fully	List Elements Fully
sent case material for case study conference. If so, discusses as needed. 3. At a case conference, places radiographs, spot films or other radiographic materials on view box or uses slides and projector. May use cine and projector and/or videotape and tape player. May have resident(s) present material. Has residents give interpretations of materials. Throws out questions about materials; evaluates and responds to answers, or answers questions and participates in discussion about cases involved. Chooses how to present answers and comments so that residents will understand how answers were arrived at. 4. At a lecture, presents material as deemed appropriate. May note whether information is being understood, and adjust presentation accordingly. 5. Performer may recommend reading to students. 6. May make personal notes on residents for use in evaluation meeting. 7. Performer may keep material and notes prepared for future use; has materials taken from library and equipment returned. Note: Does not submit outline or materials for review. Does not formally test.	

TASK DESCRIPTION SHEET

Task Code No. 349

This is page 1 of 2 for this task.

1. What is the output of this task? (Be sure this is broad enough to be repeatable.)

Outline and content prepared for lecture to medical students on gastrointestinal and biliary tract radiology; instructional materials collected, researched or prepared; lecture given.

2. What is used in performing this task? (Note if only certain items must be used. If there is choice, include everything or the kinds of things chosen among.)

Paper, pen; instructional and reading material in GI and biliary tract radiology; slides of radiographic materials; projector

3. Is there a recipient, respondent or co-worker involved in the task? Yes...(X) No...( )

4. If "Yes" to q. 3: Name the kind of recipient, respondent or co-worker involved, with descriptions to indicate the relevant condition; include the kind with whom the performer is not allowed to deal if relevant to knowledge requirements or legal restrictions.

Medical students; person in charge of medical student program; resident; library and/or clerical personnel

5. Name the task so that the answers to questions 1-4 are reflected. Underline essential words.

Planning and presenting lectures on gastrointestinal and biliary tract radiology for medical students by deciding on content, method of presentation; preparing material; presenting lecture, being aware of responses, and adjusting presentation to students' needs.

List Elements Fully

Performer presents lecture(s) on assigned aspect(s) of gastrointestinal and biliary tract radiology to classes of medical students or others who wish to attend.

1. Performer is notified of assignment or decides what should be covered, and at what depth and degree of detail, considering the students' current academic level and curriculum objectives of medical school. May request change of time or topic and discusses with program director.

2. Decides on method of presentation and plans lecture:

   a. Prepares outline.
   b. May obtain special instructional materials or asks co-worker to obtain and reviews. May use materials already prepared.
   c. May do research in topic area for use in lecture.
   d. May prepare slides from own source of radiographs or may obtain existing slides or films from library and log book.
   e. Performer may choose materials to contrast normal and pathological states.
   f. Decides on time to allocate for questions and answers.
   g. May have resident select materials for review.

3. Presents lecture as deemed appropriate. Attempts to note whether information is being understood and adjusts presentation accordingly. Uses in-

OK-RP;RR;RR

6. Check here if this is a master sheet..(X)

TASK DESCRIPTION SHEET (continued)

Task Code No. 349

This is page 2 of 2 for this task.

List Elements Fully	List Elements Fully
structional material, answers questions, depending on plans. Leads discussions. May recommend additional reading. 4. May make note of any outstanding students and may report this to person in charge of medical student program. May keep materials and notes prepared for future use. Note: Does not submit outline or materials for review. Does not formally test students' learning.	

TASK DESCRIPTION SHEET

Task Code No. 350

This is page 1 of 2 for this task.

1. What is the output of this task? (Be sure this is broad enough to be repeatable.)

Counseling meeting held with radiology resident; problem presented; advice given; remediation planned if appropriate; progress followed up; records entered if appropriate.

2. What is used in performing this task? (Note if only certain items must be used. If there is choice, include everything or the kinds of things chosen among.)

Resident's file; personal notes; standard informational materials on profession, draft, standards of performance

3. Is there a recipient, respondent or co-worker involved in the task? Yes...(X) No...( )

4. If "Yes" to q. 3: Name the kind of recipient, respondent or co-worker involved, with descriptions to indicate the relevant condition; include the kind with whom the performer is not allowed to deal if relevant to knowledge requirements or legal restrictions.

Residents in radiology; radiologists; professional contacts

5. Name the task so that the answers to questions 1-4 are reflected. Underline essential words.

Conducting counseling on professional or personal problems with residents in radiology, by deciding to call meeting on problems or agreeing to meet when contacted by resident; presenting or finding out the nature of the problem; providing guidance on professional or personal options; planning remedial work assignments and following progress; discussing with other radiologists and resident as needed; recording as appropriate.

List Elements Fully

Performer counsels residents in radiology on professional and related personal matters.

1. Performer may receive indications from other radiologists that a resident is in difficulty or displays problem behavior. The problem may have been referred to in a staff meeting on the residents. Performer may personally note that a resident is having professional and/or personal difficulties. Performer arranges for meeting.

   The resident may approach the performer and seek a counseling meeting and this is arranged formally or informally, as appropriate.

2. Performer may review resident's file.

3. At the counseling session, the problem is presented by the performer or by the resident, and/or the performer questions the resident to find out what difficulties are involved.

   Performer may indicate what has occurred or the indications that a problem exists, or ask resident for details about the issues involved.

   Performer considers what the issues involved are, whether work habits and performance are involved, whether there are personal, financial and/or draft related problems, whether the performer re-

OK-RP;RR;RR

6. Check here if this is a master sheet..(X)

TASK DESCRIPTION SHEET (continued)

Task Code No. 350

This is page 2 of 2 for this task.

List Elements Fully	List Elements Fully
quires information on career options, other institutions, etc. 4. Performer attempts to understand and counsel the resident, drawing on own experience as a radiologist, previous work with other residents, and personal knowledge of the resident being counseled. Performer may refer to professional contacts, information about professional contacts, information about professional requirements, military requirements and the quality,standards of the hospital for residents performance. 5. Performer may work out a set of performance and/or study goals for the resident, specific assignment to a radiologist for training purposes,or other work related procedures. a. Performer discusses these with resident. Records in resident's file. b. Performer discusses with any radiologists involved. c. Performer may check on resident's progress periodically by talking with the radiologists involved or by personal observation. d. Performer may decide to call subsequent meetings with resident to continue guidance in resident's development. 6. Performer may follow up on personal problem by contacting appropriate agencies, institutions or colleagues as appropriate, or filling out reference letters.	

TASK DESCRIPTION SHEET

Task Code No. 351

This is page 1 of 1 for this task.

1. What is the output of this task? (Be sure this is broad enough to be repeatable.)

Radiographs approved or disapproved for entry in GI and biliary tract log book based on teaching value; entries made including ID information and brief description.

2. What is used in performing this task? (Note if only certain items must be used. If there is choice, include everything or the kinds of things chosen among.)

Radiographs of GI and biliary tracts; related requisition sheets, notes; view boxes; log book; pen

3. Is there a recipient, respondent or co-worker involved in the task? Yes...(X) No...( )

4. If "Yes" to q. 3: Name the kind of recipient, respondent or co-worker involved, with descriptions to indicate the relevant condition; include the kind with whom the performer is not allowed to deal if relevant to knowledge requirements or legal restrictions.

Radiologists; residents

5. Name the task so that the answers to questions 1-4 are reflected. Underline essential words.

Deciding on whether to enter suggested radiographs of gastrointestinal and biliary tracts into log book based on quality and educational value by reviewing, deciding on merits, and arranging to have description entered in log book and/or materials placed for refiling.

List Elements Fully

Performer supervises the entry of new radiographic materials into the log book compendium of gastrointestinal and biliary tract studies. Performer reviews and selects materials from own work and the radiographic materials submitted for possible inclusion by co-workers.

1. Performer reviews own recommended work and radiographic work recommended by co-workers.
   a. Places on view box. Reads requisition sheet, and notes comments on case.
   b. If recommended by co-worker, may ask co-worker to discuss the merits of material for illustrative and educational use.
2. Performer decides whether the radiograph(s) are of sufficient quality and teaching value to be entered into the log book.
   a. If performer decides to include the case, performer may have resident enter in log book or does so personally. Enters identification information and a brief description of why the radiograph has been selected i.e., why it is unusual and/or what it demonstrates.
   b. Performer arranges to have all radiographic materials submitted returned for filing. Has log book returned to its regular location.

OK-RP;RR;RR

6. Check here if this is a master sheet..(X)

TASK DESCRIPTION SHEET

Task Code No. 352

This is page 1 of 2 for this task.

1. What is the output of this task? (Be sure this is broad enough to be repeatable.)

Presentation prepared and made on radiology developments or case studies; presentations of surgeons, pathologists or radiologists listened to; discussions participated in; conference opened, conducted, and closed, when appropriate.

2. What is used in performing this task? (Note if only certain items must be used. If there is choice, include everything or the kinds of things chosen among.)

Radiographic and medical equipment; radiographic materials; case histories; view boxes slide projector; cine projector and screen

3. Is there a recipient, respondent or co-worker involved in the task? Yes...(X) No...( )

4. If "Yes" to q. 3: Name the kind of recipient, respondent or co-worker involved, with descriptions to indicate the relevant condition; include the kind with whom the performer is not allowed to deal if relevant to knowledge requirements or legal restrictions.

Surgeons; pathologists; radiologists

5. Name the task so that the answers to questions 1-4 are reflected. Underline essential words.

Participating in meetings of radiologists, surgeons and pathologists to discuss new developments, cases of interest and case problems in the field of gastrointestinal and biliary surgery and radiology by planning and presenting new developments in the radiologic field, interesting case studies or problems in current cases and/or by deciding to listen to presentations about new developments in surgery, interesting case studies or case problems, and participating in discussions; leading conference sessions when appropriate.

List Elements Fully

Performer attends meetings of medical staff and co-workers in surgery and pathology to discuss areas of mutual concern such as gastrointestinal and biliary surgery.

1. Performer may prepare presentations describing new work in the field of general radiology.
   - a. Performer decides what to present and in what degree of depth and detail.
   - b. Decides on how to make presentation and what to use.
   - c. May prepare outline, obtain special instructional materials, do research on topic for use in presentation. May have resident assist.
   - d. May prepare slides from own source of radiographs or may obtain existing radiographic material, slides or cine film from library. May have subordinate assist.
   - e. At meeting, when performer is called upon, places radiographs, spot films or other radiographic materials on view box; uses cine or slide projector. Describes work selected, answers questions, and participates in discussion. May recommend further reading.
   - f. Performer, may, when appropriate, demonstrate or simulate new and/or relevant techniques, equipment or procedures.
   - g. Performer replaces materials and equipment or has this done.

OK - RP:RR:RR

6. Check here if this is a master sheet..(X)

TASK DESCRIPTION SHEET (continued)

Task Code No. 352

This is page 2 of 2 for this task.

List Elements Fully

2. Performer may attend conferences at which surgeons and/or pathologists present case studies and raise the problems involved, or performer may choose cases which are of interest from the library or personal files which are of educational interest.

    a. Performer may be told beforehand by department head or conference leader what current or past cases will be presented for discussion, or performer will discuss the type of information to be covered in order to select relevant cases.
    b. Performer obtains the radiographic materials related to the cases selected or selects appropriate cases. May have assistant gather materials for reviews.
    c. Performer reviews the radiographs and the requisition sheets involved, and any other relevant medical information such as reports and interpretations already made.
    d. Performer may make notes to use as reference, pointing out fine points with regard to interpretation of the radiographs in connection with pathological symptoms and conditions.
    e. At the conference, performer presents the radiographs involved as appropriate,and presents interpretation; makes relevant points so as to instruct the audience in the reasoning involved. Participates in the discussion, answers questions. May suggest reference articles on subject.
    f. Performer replaces radiographic materials or has these replaced.
    g. If called on to lead conference, performer opens conference; calls on co-workers to present cases; leads or chairs discussions and question period; closes meeting.

List Elements Fully

    h. If current case studies are involved, performer may maintain files on the case(s) and read reports including final diagnosis and treatment prescriptions.

3. Performer may decide to attend presentation by surgeons, pathologists or co-workers. May make notes, ask questions and/or participate in discussion.

4. Performer may decide to attend presentation about a particular case that is of interest. May make notes, ask questions and/or participate in discussion.

5. Performer may decide to present relevant problems that performer is personally having trouble with and ask for comments and suggestions from participants.

    a. Selects the case material needed to present the problem.
    b. Makes presentation and poses problems involved.
    c. Listens and participates in resulting discussions.

TASK DESCRIPTION SHEET

Task Code No. 391

This is page 1 of 2 for this task.

1. What is the output of this task? (Be sure this is broad enough to be repeatable.)

Subject area selected or ascertained in case conference in diagnostic radiology; radiographs and case history materials selected and prepared for use in presentation; discussed; materials returned and/or placed for use.

2. What is used in performing this task? (Note if only certain items must be used. If there is choice, include everything or the kinds of things chosen among.)

Radiographs in library, listed in log book and/or accumulated for use; related case history information and records; view boxes; paper; relevant literature in the radiologic field

3. Is there a recipient, respondent or co-worker involved in the task? Yes...(X) No...( )

4. If "Yes" to q. 3: Name the kind of recipient, respondent or co-worker involved, with descriptions to indicate the relevant condition; include the kind with whom the performer is not allowed to deal if relevant to knowledge requirements or legal restrictions.

Radiologist; clerical staff

5. Name the task so that the answers to questions 1-4 are reflected. Underline essential words.

Selecting and assembling radiographs and related case history information for use in case conference in diagnostic radiology by deciding on or ascertaining subject area and details to be stressed; screening available sources of radiographs; selecting appropriate examples for use and assembling related information and records; discussing choice if appropriate; returning materials and placing selected materials for use.

List Elements Fully

Performer selects and assembles case history materials in diagnostic radiology for use in scheduled case conferences of residents and radiologists as a result of:

- a. Regular assignment, for own use.
- b. Request by radiologist for radiologist's use.

1. Performer ascertains or decides on the general area of pathology to be covered. Is told or decides on what aspects of pathology are to be highlighted.

2. Performer reviews radiographic materials entered into specialty log books kept by the department, especially brought to the performer's attention, in the department library, or set aside for possible inclusion in library as a result of review of inactive radiographs, those related to autopsies or those that presented diagnostic problems:

   a. Performer screens the radiographs for possible selection by examining on view boxes and reading the accompanying information, requisitions, comments, notes, diagnostic and/or autopsy reports or other related material. If appropriate, performer arranges to obtain additional patient records.

OK-RP;RR;RR

6. Check here if this is a master sheet..(✓)

TASK DESCRIPTION SHEET (continued)

Task Code No. 391

This is page 2 of 2 for this task.

List Elements Fully

b. Performer places radiographs on view boxes in proper time sequence for each patient. Performer attempts to interpret the radiographs, looking for suspicious signs, abnormalities and/or changes over time. Compares own interpretation with those recorded. Performer may discuss own differences with written reports with the physician(s) involved or another radiologist.

c. Performer considers the quality of the radiographs in terms of their instructional value as representative of the pathological conditions and/or aspects of special interest for the case conference in question. Performer determines to what extent radiographs demonstrate the points to be stressed.

d. Performer obtains relevant literature on the procedures and/or problems of interpretation involved and evaluates the value of the radiographs in the light of the literature.

3. Performer decides what materials to use in own conference presentation or to recommend for radiologists' use. May select radiographs to contrast normal and pathological states or to demonstrate changes over time.

Performer may discuss with radiologist. Shares opinions and evaluations.

4. Once the radiographs are selected, performer selects the related case history materials to accompany the radiographs.

If the performer has selected current radiographs, performer may arrange to have them copied for use in case conference, and has the originals returned to the files. Performer arranges to make copies of related case history materials and/or reports, or decides to

List Elements Fully

do personally. Sets accumulated selected documents aside for later use.

5. Performer arranges to return all materials which have not been set aside for use.

TASK DESCRIPTION SHEET

Task Code No. 392

This is page 1 of 2 for this task.

1. What is the output of this task? (Be sure this is broad enough to be repeatable.)

Radiology case histories prepared for presentation; related lecture prepared for presentation; case histories and/or lecture presented; problems stated; discussion participated in and/or led.

2. What is used in performing this task? (Note if only certain items must be used. If there is choice, include everything or the kinds of things chosen among.)

Patients' case histories, radiographic materials, diagnostic and/or autopsy reports; projector and slides; cineradiographs and projector and/or videotapes and player; screen; view boxes; black boards, chalk; paper; pen; instructional materials; chart; pointer

3. Is there a recipient, respondent or co-worker involved in the task? Yes...(x) No...( )

4. If "Yes" to q. 3: Name the kind of recipient, respondent or co-worker involved, with descriptions to indicate the relevant condition; include the kind with whom the performer is not allowed to deal if relevant to knowledge requirements or legal restrictions.

Radiologists; pathologists; residents

5. Name the task so that the answers to questions 1-4 are reflected. Underline essential words.

Planning and presenting cases and/or related lectures on diagnostic radiology and pathology to pathologists, radiologists and residents by selecting or ascertaining content and arranging to assemble appropriate case history materials; planning presentation; making presentation of case histories, related problems, and/or related lecture; participating in discussion.

List Elements Fully

Performer presents case history material to radiologists, residents and pathologists at scheduled case conferences:

a. As regular assignment.

b. To raise problem cases.

1. Performer may be told beforehand by department head or conference leader what current or past cases and/or lecture topic will be the subjects for discussion, or performer will discuss the type of information to be covered in order to select relevant cases.

2. Performer arranges to obtain the radiographic materials related to the cases selected, or arranges to select appropriate cases and their relevant case history materials.

3. If a lecture is to be included, performer decides on the method of presentation and materials to use:

   a. Performer prepares outline for lecture.
   b. May obtain special instructional materials. May use materials already prepared.
   c. May do research in topic area for use in lecture.
   d. May prepare slides from own source of radiographs or may arrange to select existing radiographic material and slides from library.

OK-RP;RR;RR

6. Check here if this is a master sheet..(x)

TASK DESCRIPTION SHEET (continued)

Task Code No. 392

This is page 2 of 2 for this task.

List Elements Fully

List Elements Fully

e. Decides on time to allocate for questions and answers.

4. If a case conference is involved performer reviews the assembled radiographic and case history information and prepares outline to cover the salient information in appropriate order.

   a. Performer reviews the radiographs, the case history material, the requisition sheets and any other relevant medical information such as pathology or autopsy reports and interpretations already made.
   b. Performer may make notes to use as reference, to point out fine points with regard to interpretation of the radiographs in connecttion with pathological symptoms and conditions.

5. At a case conference, performer presents the information on the case(s) when called on:

   a. Performer may list the patients' name(s) and other information on a blackboard or chart.
   b. If appropriate,performer presents the relevant case history information such as name, age, general medical state, studies and examinations performed, diagnosis, recommended course of treatment, results of tests,and current condition. Includes special notes on related problems and/or treatments.
   c. Performer presents the radiographs and other records involved as appropriate; places radiographs, spot films or other radiographic materials on view boxes or uses slides and projector. May use cine and projector and/or videotape and tape player. Performer indicates evidence or suggestions of suspicious signs or abnormalities. Points to radiographic signs and criteria relevant to the diagnosis or cause of death. Highlights significant changes over time or any other interesting or unusual signs.
   d. If appropriate, performer indicates discrepancies between radiographic material and/or prior interpretations and pathology or autopsy reports. May present current problems, own interpretations or questions.
   e. Performer presents material so as to indicate the reasoning involved. Performer responds to questions or participates in discussion. Refers to patient records, own experience with patient,or calls on the staff members involved.
   f. If called on to lead conference, performer opens conference; calls on co-workers to present cases; leads or chairs discussions and question period; closes meeting.

6. At a lecture, performer presents the material as deemed appropriate. May note whether information is being understood, and adjusts presentation accordingly.

7. Performer may recommend reading to the audience.

8. May make personal notes during the course of the conference and/or discussion periods.

9. Performer may keep material and notes prepared for future use; arranges to have materials taken from library or files returned and radiographic materials replaced.

Note: Does not submit outline or materials for review.

TASK DESCRIPTION SHEET

Task Code No. 393

This is page 1 of 2 for this task.

1. What is the output of this task? (Be sure this is broad enough to be repeatable.)

Radiographs screened for instructional value; selected radiographs and accompanying records placed for use; discarded inactive radiographs placed for recycling.

2. What is used in performing this task? (Note if only certain items must be used. If there is choice, include everything or the kinds of things chosen among.)

Radiographs and related records; view boxes; paper; pen; relevant radiological literature

3. Is there a recipient, respondent or co-worker involved in the task? Yes...(X) No...( )

4. If "Yes" to q. 3: Name the kind of recipient, respondent or co-worker involved, with descriptions to indicate the relevant condition; include the kind with whom the performer is not allowed to deal if relevant to knowledge requirements or legal restrictions.

Clerical staff

5. Name the task so that the answers to questions 1-4 are reflected. Underline essential words.

Reviewing and selecting current and/or inactive radiographs for instructional use by viewing and reading related medical records; evaluating for instructional characteristics; selecting appropriate films and placing for use in instruction; placing discarded inactive radiographs for recycling.

List Elements Fully

Performer screens radiographs for possible inclusion in departmental library for instructional use as a result of:

a. Regular assignemnt.
b. Request.

1. Performer considers radiographic materials for their instructional aspects when attending presentations run by another department, and/or in reviewing radiographs connected with autopsy reports and/or in comparing radiographic diagnosis with pathology reports, and/or in reviewing inactive radiographs.

2. Performer obtains the radiographs to be reviewed and the related case history materials such as reports, requisitions, comments and notes from MD's and on medical charts. If the appropriate medical information is not available with the radiographs, or if anything is missing, performer notes which patients or identification numbers are involved and arranges to obtain the necessary documents.

3. Performer reviews the radiographs by placing on view boxes in appropriate order, inspecting and reading the related diagnostic and medical information. Performer considers the quality of the radiographs, in terms of their instructional value:

OK-RP;RR;RR

6. Check here if this is a master sheet..(v)

TASK DESCRIPTION SHEET (continued)

Task Code No. 393

This is page 2 of 2 for this task.

List Elements Fully

   a. Good representation of pathological condition or abnormal development.
   b. Good representation of normal development for a given age and/or sex to be used to contrast with pathological states.
   c. Good representation of pathological development over time. (If so, selects the sequence.)
   d. Illustrations of clear radiographic criteria for diagnoses.
   e. Illustrations of ambiguous criteria for diagnoses.
   f. Radiographic signs relevant to reported cause of death and/or pathology report.
   g. Radiographs demonstrating interesting or unusual findings in the accompanying diagnostic report.

4. Performer considers own evaluation of the instructional value of the radiographs and considers any notes or comments already noted by radiologists or residents.

5. Performer may obtain relevant literature on the procedures and/or problems of interpretation involved. Evaluates the educational value of the radiographs in the light of the literature.

6. Performer judges which radiographs to submit for inclusion in library and/or for own use based on overall assessment.

7. For radiographs selected, performer arranges to have radiograph(s) and the copies of relevant reports and case history material jacketed and placed in folders for inclusion in film library or for personal use. Places for pick up or filing as appropriate.

8. If the performer has reviewed current radiographic material, arranges to have the material selected copied for instructional use. Has originals returned to files. Has accompanying records copied if appropriate, or decides to do personally.

9. If the performer has reviewed inactive radiographs, performer arranges to have those not selected for instructional use recycled by placing in appropriate location for recycling into reusable film.

TASK DESCRIPTION SHEET

Task Code No. 394

This is page 1 of 2 for this task.

1. What is the output of this task? (Be sure this is broad enough to be repeatable.)

Discrepancies noted between radiographic and pathology and/or autopsy reports; radiographic and medical evidence evaluated for source of discrepancy; discrepancy reported; interesting cases marked for use in instruction.

2. What is used in performing this task? (Note if only certain items must be used. If there is choice, include everything or the kinds of things chosen among.)

Radiographs, diagnostic reports, medical records and related pathology and/or autopsy reports; view boxes; paper; pen

3. Is there a recipient, respondent or co-worker involved in the task? Yes...(X) No...( )

4. If "Yes" to q. 3: Name the kind of recipient, respondent or co-worker involved, with descriptions to indicate the relevant condition; include the kind with whom the performer is not allowed to deal if relevant to knowledge requirements or legal restrictions.

Clerical staff; radiologists

5. Name the task so that the answers to questions 1-4 are reflected. Underline essential words.

Comparing prior radiographic diagnoses with later pathology and/or autopsy reports and reporting discrepancies to appropriate radiologists by determining discrepancies; attempting to ascertain reasons for differences by review of patient records and reading of radiographs and diagnostic reports; reporting differences and observations to radiologists as appropriate.

List Elements Fully

Performer reports to appropriate radiologists on discrepancies between pathology and/or autopsy reports (diagnoses) and prior radiographic diagnostic reports as a result of:

a. Regular assignment.
b. Request.
c. Decision to do based on attendance at case conference.

1. Performer arranges to obtain or receives the x-ray requisition form, radiographs and diagnostic reports from radiography for a given number of (or designated) patients and obtains or receives the related biopsy (pathology) reports and/or autopsy reports.

2. If not already done, performer compares the (prior) radiographic diagnoses with the (later) biopsy and/or autopsy report(s):

   a. If the reports are in agreement performer may note this.
   b. If the reports are not in agreement, performer arranges to determine the cause of the discrepancy. Notes the areas of difference.

3. Where the radiographic and pathology and/or autopsy reports are not in agreement, performer obtains and reviews the x-ray requisition sheet, the relevant patient history

OK-RP;RR;RR

6. Check here if this is a master sheet..(X)

TASK DESCRIPTION SHEET (continued)

Task Code No. 394

This is page 2 of 2 for this task.

List Elements Fully

and any notes from the requesting physician. Performer reviews the requisition sheet following any consultation which resulted in a decision on the type of radiographic and/or other examination, and any notes on suggested technique. Performer reads the report of the radiologist who read and interpreted the resulting radiographs.

4. Performer views the radiographs on a view box, and any prior radiographs available. Performer attempts his or her own interpretation,keeping the discrepancies in mind.

   a. Performer ascertains own areas of difference with the existing interpretation.
   b. Performer notes whether the diagnosis was ambiguous, questionable, or justifiable. Notes whether the radiographic evidence was ambiguous or open to several interpretations. Performer notes whether additional studies were warranted and not ordered, or inappropriate if ordered. Performer notes whether emergency signs were not recognized.
   c. Performer makes a preliminary conclusion on whether the pathology or autopsy report(s)' diagnoses differed unavoidably or due to errors of judgment.
   d. Performer may obtain information from conference at which case is presented.

5. If appropriate or if requested, performer notes information on cases where the pathology and/or autopsy report differed in diagnostic conclusion from the radiographic diagnostic report. May note own interpretation of the source of difference as described in step 4.

List Elements Fully

6. Performer reports orally or in writing to the department head and/or the radiologist involved. May decide to report interesting or unusual findings to appropriate or interested staff members.

7. Performer may consider whether any of the cases is unusual or of special interest and warrants inclusion in museum library or should be used for study purposes. Marks jackets appropriately if so decided. May keep list of interesting cases for personal use.

8. Performer arranges to return all radiographic and other materials and records.

TASK DESCRIPTION SHEET

Task Code No. 395

This is page 1 of 3 for this task.

1. What is the output of this task? (Be sure this is broad enough to be repeatable.)

Decision made on whether to go ahead with air contrast study of stomach; patient reassured; air and barium mixture administered; stomach observed with fluoroscopy and spot films taken; radiographs ordered; complete set of radiographs approved; medical impressions, orders, and follow-up care recorded; MD notified of emergency signs.

2. What is used in performing this task? (Note if only certain items must be used. If there is choice, include everything or the kinds of things chosen among.)

X-ray requisition form and patient's chart; scout film; view boxes; straw,or carbonated beverage in container, or gas releasing powder; prepared barium colloidal suspension; fluoroscope, TV monitor, spot film device with cassettes or roll film; pen; telephone; cancellation forms; protective lead garments

3. Is there a recipient, respondent or co-worker involved in the task? Yes...(X) No...( )

4. If "Yes" to q. 3: Name the kind of recipient, respondent or co-worker involved, with descriptions to indicate the relevant condition; include the kind with whom the performer is not allowed to deal if relevant to knowledge requirements or legal restrictions.

Any non-pediatric patient to have air contrast stomach radiography; radiologic technologist; referring MD; radiologist

5. Name the task so that the answers to questions 1-4 are reflected. Underline essential words.

Conducting a radiographic air contrast study of stomach of any non-pediatric patient by deciding whether to go ahead based on patient's condition and scout film; reassuring patient; supervising oral administration of air and of barium mixture; viewing on fluoroscope monitor and taking spot films as decided; ordering radiographs; deciding when examination is completed by viewing radiographs; recording medical impressions, follow up care and/or delayed films; notifying MD of emergency signs.

List Elements Fully

Performer receives the x-ray requisition form and medical information for a patient scheduled for an air contrast study of the stomach. Performer may have decided to proceed to air contrast study after having done a barium study of the patient.

1. If not already done, performer reads the patient's requisition form and relevant information to become familiar with the case or to review materials seen earlier (such as earlier barium contrast study of gastrointestinal tract).

   Notes any medically relevant history, requests from referring physician. Notes whether patient should have followed preparatory procedures prior to the examination, whether patient has infectious or communicable condition or is pregnant. Performer views prior radiographs and spot films on view boxes. May call referring physician to discuss or to obtain additional information.

2. If not already done,performer greets patient in examination room. Attempts to reassure;explains what will be done; answers questions. Performer may question patient about symptoms in relation to the condition being studied. May collect additional medical history; determines whether female patient may be pregnant.

OK-RP;RR;RR

6. Check here if this is a master sheet..(X)

TASK DESCRIPTION SHEET (continued)

Task Code No. 395

This is page 2 of 3 for this task.

List Elements Fully

Performer questions patient about the preparatory regimen prescribed to see if it was followed (e.g. not having breakfast). If performer finds that the regimen has not been followed and will interfere with the study, performer cancels examination, records reasons and any recommendations on cancellation form or has co-worker arrange for cancellation; has patient rescheduled if appropriate.

3. If performer decides to proceed, performer orders scout film and views when ready or views scout film already prepared by technologist.

   Performer decides whether the technical quality of the radiograph adequately demonstrates the organs to be studied for purposes of interpretation; if not, performer indicates the needed technical adjustments or changes in position to technologist or records on requisition form, as appropriate.

4. If performer decides to proceed, performer dons protective lead garments; makes sure that patient and anyone remaining in room is properly shielded.

   a. If spot film attachment uses cassettes, performer has cassette inserted. Chooses full, half or quarter format and sets as appropriate. (If roll film attachment, checks that attachment is loaded with film or has this done.) Has technical factors set for fluoroscopy.
   b. Performer decides whether to have patient take in air (so as to distend the stomach) by use of a straw, carbonated beverage or a gas-releasing powder. Indicates to technologist what to prepare.

5. Performer has the patient stand erect before the fluoroscope table. Has the patient take in air as decided:

List Elements Fully

   a. If straw is to be used, has patient suck in air from a straw with a hole in it held so that the hole is outside the patient's lips.
   b. If a beverage is to be used, has patient drink an appropriate amount of a carbonated beverage supplied to patient.
   c. If a gas-releasing powder is to be used, has patient swallow powder washed down with a sip of barium sulfate mixture.
   d. Performer places fluoroscope unit in front of patient. Has patient or technologist hold cup containing barium sulfate mixture and await orders from performer.

6. When ready for fluoroscopy, performer may have lights in room dimmed; turns on fluoroscope or has this done. Adjusts unit to view patient on TV monitor.

   If patient has just completed a barium study performer notes whether the barium coating is sufficient to eliminate need to drink barium mixture.

7. Unless patient's stomach is already coated with barium, performer indicates to technologist (or patient if patient is holding barium mixture) when patient is to sip barium mixture, hold in mouth, when to swallow, what positions to assume, when to hold steady, and when to hold breath.

   Performer has patient take erect position if upper part of stomach is to be studied. If not, performer may assist patient on table or may have technologist assist patient to take appropriate supine, prone, or oblique position(s).

   a. Performer observes the flow of the barium through the patient's esophagus, esophago-gastric junction

TASK DESCRIPTION SHEET (continued)

Task Code No. 395

This is page 3 of 3 for this task.

List Elements Fully

and stomach. Notes whether there is sufficient distension of the top and/or distal stomach.

b. Performer observes the stomach structures and movement until the performer has sufficient information on any pathological condition.
c. While observing on TV monitor, performer decides what to record as spot films. As decided, performer activates spot film attachment and x-ray button. If cassette attachment, may have technologist remove cassette as spots are snapped and insert additional cassettes, or performer does so personally.

8. Performer has patient lie on tilt table in the remaining positions required. For each position performer repeats the fluoroscopy and spot filming as described above.

9. Performer determines when the fluoroscopic portion of the examination is over and turns off the fluoroscope.

   a. Performer decides, based on observations during fluoroscopy and requisition sheet, whether to have radiologic technologist take a series of overhead radiographs. Explains what is needed to technologist and/or enters on requisition sheet.
   b. Performer may record preliminary medical impressions at once on requisition sheet or delay until the radiographs are processed.

10. Performer looks at the processed spot films and radiographs on view boxes as soon as they are ready:

   a. Determines whether the radiographs are technically adequate to demonstrate the area and condition under study and provide sufficient information to make possible a competent medical interpretation. Performer may ask opinion of clinician or another radiologist.
   b. Performer decides whether to order additional views, a change in the technical factors and a repeat of prior portions of the radiographic examination. Considers the information already available on the radiographs, the way in which the patient responded to the procedure, the patient's condition, and his or her cumulative exposure.

11. If the performer decides to order additional views or a repeat with changes in the technical factors, informs technologist what is needed; may record. Performer examines additional radiographs as described above.

When performer has determined that the current examination has been completed, informs technologist that he or she can terminate the procedure and have the patient sent home, back to room, or to next procedure. If appropriate has decontamination and/or sanitary clean up procedures carried out.

12. If performer judges that any emergency signs are in evidence, performer notifies patient's physician at once.

13. Performer may record impressions of procedure on patient's chart:

   a. Preliminary findings.
   b. How patient tolerated procedure.
   c. Any special nursing follow-up recommended.
   d. May sign chart or requisition sheet.

TASK DESCRIPTION SHEET

Task Code No. 396

This is page 1 of 4 for this task.

1. **What is the output of this task? (Be sure this is broad enough to be repeatable.)**

Decision made on approval of neurologic radiographic procedure for a patient; recommendations made on method, technique, contrast, equipment, prior tests, patient preparation, premedication, anesthesia; record entered of decisions, orders, and/or recommendations; record placed for scheduling; scheduling expedited if so decided.

2. **What is used in performing this task? (Note if only certain items must be used. If there is choice, include everything or the kinds of things chosen among.)**

X-ray requisition form and patient's chart; relevant prior radiographic, ultrasonographic, radioisotope brain scans, computerized transverse axial tomographic scans, EEG materials and reports; telephone; view boxes; pen; dictating equipment

3. **Is there a recipient, respondent or co-worker involved in the task? Yes...(X) No...( )**

4. **If "Yes" to q. 3: Name the kind of recipient, respondent or co-worker involved, with descriptions to indicate the relevant condition; include the kind with whom the performer is not allowed to deal if relevant to knowledge requirements or legal restrictions.**

Physician requesting neuroradiographic procedure(s); neurologist; anesthesiologist; secretary or clerk

5. **Name the task so that the answers to questions 1-4 are reflected. Underline essential words.**

Deciding on type of neuroradiologic procedure(s) to order for any patient in consultation with referring physician and/or neurologist, by reviewing case history and relevant materials, discussing, considering contraindications and need; approving, recommending alternative studies, postponement, and/or refusing approval; dictating reasons for refusal if requested; if approved, recommending method, technique, anesthetic, patient preparation; recording orders and recommendations; placing for scheduling and/or typing; expediting if appropriate.

List Elements Fully

Performer decides on what neuroradiographic examination to order for a patient upon receipt of a request from a referring physician on an x-ray requisition form, by phone, or in person. Request may be for one or more neuroradiologic studies such as angiography of the brain, cerebrum or spine, pneumoencephalography, ventriculography, myelography, skull films, conventional skull tomography and/or computerized transverse axial tomography.

1. Performer reads the x-ray requisition form and the patient's history to learn the nature of the problem, the presenting symptoms, the suspected pathology, the studies and/or procedures requested, and special requirements. Notes whether request is urgent, whether need is for diagnosis or information prior to or subsequent to surgery or other therapy.
   a. Performer notes the patient's age, sex, weight, height, the specific procedure requested, the purpose. Notes name of the referring physician.
   b. Performer studies the relevant medical history and recorded symptoms of the patient, the suspected nature and location of the pathology, and relevant background information. If any prior radiography, clinical, and/or EEG tests

OK-RP;RR;RR

6. Check here if this is a master sheet..(X)

TASK DESCRIPTION SHEET (continued)

Task Code No. 396

This is page 2 of 4 for this task.

List Elements Fully

have been carried out, performer notes results. If any relevant prior radiographs, radioisotope scans, ultrasonograms or computerized transverse axial tomographic scans are available, performer studies these and their related reports to become more familiar with the nature of the current diagnostic information.

c. Performer notes evidence of the presence of conditions which may be contraindications to the procedure requested or which would affect the choice of vascular route, contrast medium and decisions on prior preparation of the patient. Notes known sensitivity to iodine, prior response to contrast media, or general history of allergy, severe heart disease, hypertension, problems with clotting, or other potential problems.

d. Performer notes the patient's general health and probable ability to withstand the procedure; notes whether there is current emergency need for the procedure.

e. Performer notes whether patient (if female) is pregnant, is taking oral contraceptive; notes whether patient has a communicable or infectious condition.

f. If the performer finds that the information provided is inadequate, performer arranges to have other materials sent or discusses needed information with relevant physician.

2. Depending on the equipment available at the institution, performer may consider which radiographic technique is most adapted to purpose of study, nature of pathology, size of area of interest and location.

List Elements Fully

a. Considers the least invasive, most accurate technique as applied to age and size of patient.

b. Considers whether patient can cooperate as required for the techniques available. Considers whether one or a combination of examinations is warranted.

c. Performer considers any contraindications in relation to the need for additional information. Considers the severity of the symptoms, the extent of definition on any current radiographs, and/or the suddenness of the appearance of the abnormalities in relation to the possible adverse affects of procedure on patient, and/or the patient's cumulative level of radiation exposure.

d. If the condition or the nature of the request warrants it, performer may arrange to discuss request with patient's attending physician or appropriate specialist, such as neurologist.

e. Performer may consider recommending a delay in the procedure while the patient's clinical status is improved, such as with measures to bring blood pressure levels to normal, treatment of infection, nutritional inadequacy; may consider, with allergic patients, premedication with antihistamines or related drugs; may consider additional tests including sensitivity test to contrast medium. May order cessation of anticoagulant therapy.

f. Performer decides whether to approve request, delay scheduling and order prior procedures to strengthen patient, order additional or alternative studies, reorder earlier studies, or recom-

TASK DESCRIPTION SHEET (continued)

Task Code No. 396

This is page 3 of 4 for this task.

List Elements Fully

mend no neuroradiology based on the information obtained and any discussion.

3. If performer recommends against a request, discusses with referring physician and writes reasons for refusal on requisition sheet, or destroys requisition if agreed to by referring physician.

   If requested by physician, performer dictates a report on the decision, presenting his or her interpretation of any current radiographs, assessment of case, reason for refusal, and any other relevant comments. Returns materials on patient, and places dictated report to be picked up for typing.

4. If performer and physician agree on the requested or alternative studies, or if performer decides to postpone approval of the study, performer may decide to make recommendations on method, technique, depending on nature of study and patient's condition. May discuss with clinician or neurologist if appropriate.

   a. May recommend type of entry, initial entry site for injection, the type of contrast medium (air or positive contrast), the use of automatic or hand injection, use of biplane or single plane seriography.
   b. If conventional tomography is involved, may recommend type of tube motion, number, level, interval distance for tomogram "cuts." Indicates positions.
   c. If computerized transverse axial tomography is involved, may suggest tissue density enhancement with IV injection of contrast, number and levels of planes of interest, angulation, and thickness of "slice"

List Elements Fully

for the scans. Makes sure to have this examination precede any contrast study where residual contrast would interfere with accuracy of results.

   d. Performer decides whether to order routine study or special variations on normal routine procedures.
   e. Performer may consider the appropriate type of anesthesia, whether general and/or local; may discuss with anesthesiologist.
   f. Performer may order preliminary procedures or prior preparation of patient, or may discuss with attending physician and have this done. Such orders may include any or all of the following:

      i) Collection of relevant information such as lab test results, electrolyte level, ECG, EEG, vital signs, clotting time and prothrombin tests, result of allergy test to contrast medium.
      ii) Prior requirements for food and/or liquid intake, cleansing enema, and/or cathartic, and appropriate timing for these, based on the patient's age, the suspected pathology, and contraindications. May have female patient taken off oral contraceptive.
      iii) Prior administration of an intravenous infusion, sedation, or medication to reduce possible allergic reaction.
      iv) Special procedures to prevent infection or contamination of the patient or environment.
      v) If procedure is delayed, measures to improve the patient's strength and clinical status prior to the neuroradiography procedure.

Task Code No. 396

This is page 4 of 4 for this task.

List Elements Fully	List Elements Fully
g. Performer may arrange to have patient contacted to sign a consent for the procedure. If patient is a juvenile or is not legally competent, performer may arrange to have proper person contacted so that a consent for the procedure can be signed. h. Performer writes orders and recommendations on technique, anesthetic, and preparatory procedures for patient on patient's chart or requisition form explicitly so that physicians, nurses, technologists and other personnel can be scheduled for work. i) May specify need for ECG monitoring equipment, need for attendant for behaviorally disturbed patient. ii) Gives information to appropriate secretary for scheduling. Signs requisition sheet if appropriate. iii) Performer considers the urgency of the need and, if appropriate, expedites scheduling personally by discussing with appropriate staff person(s).	

TASK DESCRIPTION SHEET

Task Code No. 397

This is page 1 of 12 for this task.

1. What is the output of this task? (Be sure this is broad enough to be repeatable.)

Pt. examined,reassured;decisions made on going ahead,method,technique,site of puncture,contrast medium,injection,serial filming;preparatory orders given;site anesthetized;artery punctured;needle placed or guide wire and catheter advanced under fluoroscopic control;injection and filming coordinated;magnification,subtractions ordered;cerebral angiograms reviewed,and/or procedure continued until final approval; instruments removed;site compressed;orders for after care,medical impressions recorded.

2. What is used in performing this task? (Note if only certain items must be used. If there is choice, include everything or the kinds of things chosen among.)

X-ray requisition form;pt.'s medical chart,prior films,scans;pen;view boxes;sterile tray with antiseptic,saline,anticoagulant,swabs,tape,scissors, gauze,pressure dressings,local anesthetic,syringes, puncture needles,scalpels,guide wires,catheters; automatic injector;iodine-based contrast;table;serial film changer(s);fluoroscope,TV monitor;emergency cart;sterile gown,gloves,drape;shielding;obturator

3. Is there a recipient, respondent or co-worker involved in the task? Yes...(X) No...( )

4. If "Yes" to q. 3: Name the kind of recipient, respondent or co-worker involved, with descriptions to indicate the relevant condition; include the kind with whom the performer is not allowed to deal if relevant to knowledge requirements or legal restrictions.

Any pt.;authorized adult;attending MD;radiologist;anesthesiologist;neurologist;radiologic technologist; nurse;neurosurgeon

5. Name the task so that the answers to questions 1-4 are reflected. Underline essential words.

Conducting cerebral angiography of any pt. by examining,reassuring pt.,obtaining consent;deciding on method,technique,site,preparation;deciding whether to go ahead,manual or automatic pressure injection, rate,speed for serial filming;injecting local anesthetic;making puncture and advancing needle or catheter and guide wire under fluoroscopic control;coordinating injection of contrast and filming;ordering magnification,subtractions;evaluating cerebral angiograms;ordering additional injections as appropriate; removing instruments;ordering after care;recording orders,medical impressions.

List Elements Fully

Performer receives the x-ray requisition form and medical chart of a patient scheduled for cerebral angiography (radiographic contrast study of the vascular system of the brain) prior to the procedure, such as on the previous day or evening.

1. Performer reads the patient's medical history and requisition form to review the case or to become familiar with materials seen earlier in consultation in order to make decisions about the conduct of the radiographic study and to check on the request of the referring physician:
   - a. Performer notes the patient's age, sex, weight, height, referring physician. Notes nature and location of the suspected pathology or symptomology, such as suspected intracranial diseases and lesions.
   - b. Performer notes whether request is for a complete angiographic bilateral study or for localized condition.
   - c. Performer reviews the diagnostic information already obtained, including any prior radiographs, radioisotope scans, ultrasonograms, computerized brain scans, results of clinical tests, lab tests, ECG, and vital signs.

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6. Check here if this is a master sheet..(X)

TASK DESCRIPTION SHEET (continued)

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d. Performer notes relevant prior history such as prior incidents of vascular constriction, removal of any section of the vascular system, grafts and their sites, history of atherosclerosis, heart disease, stroke, renal, pulmonary, or brain disease, history of allergies or indications of allergy to iodine-based contrast media. If already done, notes results of allergy test, clotting time tests; notes stage of female patient's menstrual cycle, any possibility of pregnancy, whether on oral contraceptive. Notes whether patient has an infectious or communicable condition.

e. Notes whether prior orders have been given to improve patient's clinical condition; if so, notes progress.

f. Performer notes recommendations on method of examination (percutaneous needle or selective catheterization), site and route of entry (right or left femoral, brachial or carotid arteries), use of subtraction, magnification, use of general or local anesthesia and/or prior sedation, use of equipment and materials.

g. Checks to see whether patient or authorized adult has signed consent for procedure. If not, may decide to obtain personally before sedation.

h. Performer may discuss case with referring clinician, neurologist, or surgeon to obtain additional information. May arrange for attending physician, anesthesiologist and/or neurologist to accompany performer in examination of patient prior to the procedure.

2. Performer visits patient and any authorized adult at bedside or in appropriate location. May be accompanied

List Elements Fully

by clinician, anesthesiologist, or neurologist.

a. Performer greets patient and/or authorized adult and explains that a brief examination will occur. If any colleagues are with performer, performer introduces them. Reassures and answers questions.

b. Performer reads patient's chart. Notes any new clinical developments, response to care or medication. May ask patient or accompanying adult about symptoms and allergies. Examines the patient for relevant symptoms and neurological symptoms of alertness, general state of consciousness, degree of paralysis (if any) and ability to move extremities. Reassures and answers questions. If not already done, performer determines whether there is any possibility of pregnancy in the case of a female patient.

c. Performer considers whether there have been changes in the patient's condition since the decision was made to do the procedure, and considers whether there are contraindications to going ahead with the procedure. May confer with clinician or specialist such as neurologist; discusses patient's current condition. Decides whether to proceed, cancel, or delay procedure based on assessment of patient's current condition and any discussion.

d. If performer decides not to have procedure done, may discuss with clinician. Records reasons for cancellation and any recommendations such as for alternative procedure on patient's chart. Informs staff of cancellation and discusses with patient.

TASK DESCRIPTION SHEET (continued)

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e. Performer may decide to delay procedure, have patient undergo treatment to improve clinical condition, such as treatment for abnormal blood pressure, infectious condition, or malnutrition. Discusses as appropriate and has orders given for care of patient. If patient has been on anticoagulant therapy, may order cessation until prothrombin and/or clotting times are within normal levels. May order cessation of oral contraceptive.

f. If performer decides to proceed, examines relevant arterial pulses to determine best vascular method and entry site:

i) Notes strength and expansive nature of the pulsations, presence of bruits (murmurs), presence of grafts, presence of ischemic symptoms. Reviews recommendations.

ii) Performer selects the method of entry (selective catheterization or direct needle puncture) and the vessel to enter depending on the condition of the pulses, location of pathology, areas of interest, clinical and surgical history, age, nature of symptoms, condition of vessels, and degree of detail required. Selects puncture site considering condition of area and convenience for the procedure. Avoids use of catheter and guide wires or direct puncture where there is severe atherosclerotic involvement.

iii) Performer examines and records condition of the extremities, presence and character of pulses at, and distal to, the artery to be punctured.

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g. Performer decides on the type of equipment to use based on institutional facilities and nature of study:

i) If selective catheterization is ordered, may indicate type of catheter, whether preshaped, with side holes, whether radiopaque. For direct needle puncture, orders size and type based on puncture site and patient's size and condition.

ii) Decides on contrast solution, use of manual or automatic injection, use of bi-plane or single plane serial changer, subtraction, degree of magnification (if any).

iii) Performer decides on program for seriography, including timing of injection to provide for plain films for subtraction masks and proper elapse of time to provide venograms if appropriate. May record the number of films to be taken, the per-second intervals, and the number of series anticipated.

iv) If a bi-plane study is involved, orders AP and lateral projections or indicates desired angulation. Indicates whether bi-plane films will be taken simultaneously or sequentially.

h. If performer decides to proceed and a consent for the procedure has not been obtained, performer may explain to the patient or guardian in comprehensible language what will occur in the procedure, its purpose, and the dangers to the patient involved. Performer explains the alternatives; answers questions.

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- i) When the performer is sure that the patient understands the risks, asks the patient for signature on consent form and checks that it is properly signed.
- ii) If a guardian is to sign, performer explains to the individual as appropriate.
- iii) If a consent is not agreed to, performer postpones procedure until it is obtained. May discuss with appropriate physician or individuals and/or or with patient. Does not proceed unless consent is obtained.

i. When a consent is obtained performer makes decisions on preparatory care of patient:

- i) Decides on use of general and/or local anesthetic. May discuss with anesthesiologist. If a general anesthetic is to be administered, performer arranges to have staff ready at the appropriate time.
- ii) Performer makes final decisions on prior preparation of the patient such as sedation, period for withholding of food, hydration, use of prior IV drip, shaving of entry site, prior administration of antihistamine, medications to deal with problems of blood clotting.
- iii) Performer records as appropriate so that patient can be prepared and staff assigned. May sign requisition; places for scheduling.

j. Performer records orders for equipment such as types and sizes of needles, catheters, guide wires, contrast solution, use of seriography, injection equipment.

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k. Reviews with patient the procedures that will occur.

3. Just prior to the time for which the procedure is scheduled, the performer reviews all the relevant medical information and the patient's chart. Reviews relevant prior radiographs and scans. Notes any new developments.

a. Performer greets patient in examination room. May question about symptoms; reassures and explains what will occur.

b. Performer checks that all prior preparatory procedures have been carried out.

- i) Checks reports on electrolyte levels, blood clotting time, vital signs.
- ii) Checks that any orders for hydration, starting of IV infusion, prior administration of medication or sedation have been carried out, and at appropriate time. If not, arranges to have these done and/or procedure delayed.

c. Performer considers whether patient's current condition presents any contraindications to going ahead with the procedure. May have clinician or neurologist called; discusses patient's condition and any alternative steps. Decides whether to proceed or not based on evaluation of patient's condition and contraindications.

d. If performer decides not to proceed, records reasons and any recommendations on patient's chart. Informs appropriate co-worker of cancellation and has patient returned to room. If appropriate, orders rescheduling of patient

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or scheduling for alternative procedure.

e. Performer examines puncture site to review earlier decision. Makes sure no swelling or tenderness is present. Considers alternative puncture site if appropriate.

f. If patient is pediatric patient or if general anesthesia has been suggested for adult, performer may reconsider whether general anesthesia is still warranted; may decide to order if patient's behavior and condition suggest the need. If general anesthesia is to be carried out, performer discusses with anesthesiologist when it is to be administered and plans to coordinate with anesthesiologist.

g. May order sedation and/or IV drip if appropriate and not already administered. Has puncture site and possible alternative sites shaved and prepared if not already done.

h. Performer may explain or demonstrate use of equipment to a child to allay fears and enlist cooperation; answers questions. Explains that patient will be asked to hold still from time to time. Indicates what will happen, what pain might be experienced, and what cooperation will be needed. Stresses need to maintain positions when ordered.

4. Performer makes final decisions on technique and surgical procedures:

a. Decides on or checks sizes of needles, catheters, guide wires. Decides on type and amount of contrast material, use of manual or automatic injection, use of biplane or single plane serial changer(s).

b. Orders degree of magnification if appropriate.

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c. If a bi-plane study is involved, orders AP and lateral projections or indicates desired angulation. Indicates whether bi-plane films will be taken simultaneously or sequentially.

d. Performer reviews orders on program for seriography, including timing of injection to provide for plain films for subtraction masks and proper elapse of time to provide venograms if appropriate. Informs technologist of the number of films to be taken, the per-second intervals, and the number of series anticipated. Has equipment checked.

e. Has technical factors set for fluoroscopy.

f. Performer orders scout film(s) as appropriate for single or bi-plane views. Makes sure proper shielding is being used.

i) Performer places the processed scout films on view boxes and examines as soon as they are ready. Performer considers whether the areas of interest are visible;notes areas of possible complication. Notes whether the technique is satisfactory,and whether the position(s) of the patient are correct.

ii) If the scouts are not satisfactory, performer indicates the needed changes in technique or in the patient's position to the radiologic technologist.

g. If general anesthesia is to be administered, indicates to anesthesiologist when procedure is to start and allows for appropriate timing.

h. Informs appropriate co-workers of new decisions so that patient and materials can be prepared.

TASK DESCRIPTION SHEET (continued)

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5. Performer returns to patient in procedure room when informed that patient and equipment are ready:

   a. Checks whether patient has been properly shielded, immobilized and prepared for sterile puncture procedure. If not acceptable, indicates the needed adjustments. May decide to immobilize personally.
   b. Checks sterile tray prepared for procedure. Requests any missing objects.

      i) Performer checks that appropriate needle and catheter sizes are available and catheters preformed if appropriate. Checks guide wires. May bend catheters personally.
      ii) Performer may prepare or check percutaneous needle to be used.
      iii) Checks that syringes with saline and/or anticoagulant solution are prepared, that syringes with contrast medium are ready.
      iv) Checks appearance of contrast medium to be sure there is no chemical deterioration; checks amount.
      v) May prepare syringe with local anesthetic or checks.

   c. If patient has special equipment such as IV or indwelling catheter, performer makes sure that these are being monitored. May check that ECG monitoring equipment is present. Checks that emergency cart is present.
   d. Checks that seriography equipment is ready for use, that technical factors are set for seriography and fluoroscopy, and that equipment for manual or automatic pressure injection is checked and ready for use.

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   e. Dons protective lead garments and sterile gown and gloves when appropriate. Checks staff shielding.
   f. If patient is coherent, performer explains what will be done. Answers patient's questions as appropriate. Reassures patient and does so as deemed needed throughout procedure.
   g. If general anesthesia is to be administered, checks with anesthesiologist to be sure that the patient is ready for procedure to begin.

6. Performer proceeds to prepare the puncture site using sterile technique:

   a. Has patient positioned appropriately for the puncture site chosen so as to provide access.

      i) For puncture of femoral artery, positions patient for access below the inguinal ligament as high as possible, but allowing for later compression of the vessel proximal to the puncture site.
      ii) Performer locates the vessel for puncture visually and/or by feeling for arterial pulsation in the location selected. May choose more palpable position in vessel allowing for later compression.

   b. Prepares the site for injection of the local anesthetic and puncture by swabbing with prepared antiseptic solution. Covers surrounding areas with sterile drapes, leaving only small area for injection and puncture uncovered.
   c. Checks amount of local anesthetic to be injected as shown by nurse

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in syringe, or draws anesthetic into sterile syringe. Checks no air is present; inserts needle intradermally and subcutaneously; injects. Makes sure to infiltrate the skin and the sheath of the artery on both sides of the vessel. Removes needle. Waits for area to become anesthetized.

7. If selective "Seldinger" catheterization is to be done, performer proceeds as follows:

   a. If patient is conscious, explains when patient is to hold steady for puncture.
   b. Performer feels for the appropriate arterial pulse by palpating with fingers. Makes an incision or nick through the skin with a sterile scalpel at the site where the needle and catheter will enter.
   c. Performer inserts puncture needle tip (appropriately sized hollow needle with sharp cutting inner stylus) into incision while palpating and fixing the artery. Performer angles needle to enter along the lateral side of the vessel with the tip directed towards the vessel of interest to be catheterized. May attempt to enter only the anterior wall.
   d. Performer pulls out the needle's inner stylus and withdraws the needle slowly until a characteristic "pop" is felt and a vigorous jet of arterial blood is obtained.

      i) May advance needle into the artery in the direction of the route to be catheterized.
      ii) May pull back on needle, reinsert, or make other incisions until artery is successfully entered.

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   e. Performer inserts a curved tip safety guide wire into the needle and advances this into the vessel in the direction of the planned route for catheterization.
   f. Once the guide wire is inserted, performer withdraws the hollow needle, compressing the artery to reduce the bleeding. Cleans blood off guide wire. Inserts the appropriate size catheter by threading catheter over the guide wire and into the artery.
   g. Performer decides whether to advance the catheter using the guide wire as a leader or to remove guide wire. If so decided, removes guide wire. May advance guide wire before removing needle and introducing catheter.
   h. Performer may check position of catheter at this point. If so, positions the overhead fluoroscope unit over the patient; may have lights in room dimmed; activates the fluoroscope; adjusts technical factors or has this done. Adjusts position of guide wire and/or catheter to be sure that the catheter is free to pass along the lumen of the vessel.
   i. Performer advances the catheter (with or without guide wire as a leader) under fluoroscopic control as appropriate to planned injection site:

      i) In advancing the catheter and/or guide wire, performer is careful not to force passage.
      ii) If an obstacle is encountered, performer checks position using fluoroscopy, syringe and small amount of contrast solution (as described below). Injects a small amount of contrast into the artery through the catheter,

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activates fluoroscope, and views on the TV monitor. Determines problem and redirects guide wire or catheter as appropriate.

iii) If performer judges that entry through site chosen cannot be properly accomplished, performer may decide to enter from an alternative route, from the opposite side artery, or by direct needle puncture. Performer repeats appropriate steps for new location after properly caring for initial site.

j. Performer has syringe prepared with saline and/or an anticoagulant. Flushes catheter periodically to avoid clotting and to keep catheter clear.

8. If direct percutaneous needle puncture is to be done, performer proceeds as follows:

a. Performer feels for the appropriate arterial pulse by palpating with fingers. May make an incision or nick through the skin with a sterile scalpel at the site where the needle will enter.
b. If patient is conscious, explains when patient is to hold steady for puncture.
c. Performer inserts a two-part needle or a teflon needle equipped with stylet and teflon sheath into the incision while palpating and fixing the artery. Performer angles needle to enter along the lateral side of the vessel with the tip directed along the course of the artery. May attempt to enter only the anterior arterial wall.
d. Performer pulls out the solid inner part of the hollow needle or stylet of teflon needle slowly until a characteristic "pop" is

List Elements Fully

felt and a vigorous jet of arterial blood is obtained. May advance needle into the artery in the direction of the arterial flow. May pull back on needle, reinsert, or make other incisions until artery is successfully entered.
e. Performer may insert a guide wire into needle several inches into the vessel and advance the needle over this to lodge it firmly in the lumen of the vessel. Removes guide wire and wipes off blood. When not in use, inserts obturator in needle. Performer may secure needle with tape.
f. With teflon needle performer removes stiff inner needle after checking correct placement (as described below in step 9) leaving teflon sheath in place. May advance sheath several inches into lumen of vessel.
g. Performer may attach syringe prepared with saline and/or anticoagulant to needle (via tubing attached to needle) or to teflon sheath. Flushes periodically to avoid clotting.

9. Performer may use overhead filming or fluoroscopy to check placement of catheter or needle. Performer has a syringe prepared with a small amount of the contrast solution. Checks that medium is appropriate. Connects syringe to the needle or catheter.

a. Performer may position overhead x-ray tube to take view that will show depth of entry into artery or positions fluoroscope unit over patient and activates.
b. Performer has patient hold still. Injects small amount of contrast solution into the artery for viewing location of needle or catheter.

List Elements Fully	List Elements Fully
c. With overhead, has technologist take radiograph. Performer views radiograph on view box when it is brought or goes to automatic processor. Evaluates and decides whether needle is at correct depth and "lie" in lumen or needs to be readjusted. Repeats insertion and radiography until this is accomplished. d. With fluoroscopy, locates site of entry of catheter and checks position of catheter within vessel by viewing on TV monitor. Performer judges whether catheter is correctly inserted in lumen of vessel rather than in an intramural or extravascular position by viewing on TV monitor and watching flow of test dose. Readjusts or reinserts catheter, checking on fluoroscope monitor until this is accomplished. May use guide wire as leader. e. If performer judges that injection through site chosen cannot be properly accomplished, performer may decide to enter from the opposite artery or alternative route if appropriate. If so, performer repeats appropriate steps for new location after caring for initial site. f. If entry or placement cannot be easily accomplished, performer may decide to terminate so as to avoid further trauma to vessels. If so, performer records as appropriate and informs staff. May arrange for rescheduling. g. Performer reattaches syringe with saline and/or anticoagulant to needle or catheter and flushes entry site periodically. 10. Performer prepares for immediate injection of contrast and filming:	a. Has patient positioned as appropriate for selected projection or AP and lateral bi-plane study. b. Indicates whether more than one injection is anticipated, and sequence of programs. c. Makes sure proper (close) collimation will be observed and appropriate shielding is in place. d. Performer checks that materials are ready for manual or automatic pressure injection of the contrast solution and for serial filming. Checks that patient is properly immobilized, shielded and positioned. e. If pressure injection is to be done by hand, performer prepares or checks syringe with the iodine based, aqueous contrast solution for correct quantity, depending on vessels to be opacified. Uses the minimum amount necessary. f. If pressure is to be done by automatic injector, performer prepares to coordinate injection with filming: i) Checks that the automatic injector is loaded with proper amount of medium in syringe; checks that syringe is attached to injector tubing. Attaches tubing to catheter. Checks that there is no air in system. ii) Performer determines, sets, or orders the rate and pressure setting for the entry force of the automatic injector. Considers the force of entry needed to inject the contrast medium into the vessels, given the vessels and other conditions involved. g. Has patient hold steady, if conscious, or awaits indication from

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anesthesiologist that respiration has been suspended.

h. Tells technologist when to start the automatic film changer (to make sure that it is functioning) to take the series of pre-programmed radiographs in relation to the injection of the contrast solution. Once changer(s) start, allows for filming without injection for subtraction masks.

   i) If injecting automatically, activates the automatic injector at appropriate time.
   ii) If injecting by hand, injects in predetermined amounts spaced periodically as decided using syringe attached to catheter or needle.
   iii) Allows time for venograms if appropriate.

i. Performer may decide to view serial films for the first projection(s) ordered before continuing with other views. If injecting and filming continuously, performer repeats appropriate steps for additional views and patient positions. May order subtractions; arranges to have angiograms processed as appropriate.

11. While serial films are being processed, performer examines and talks to patient (if conscious) to evaluate how the patient has responded to the procedure and the injection.

   a. Detaches injector tubing; reflushes catheter or needle.
   b. If ECG is being monitored, evaluates any changes during initial injection as possible contraindication for additional injections.
   c. May decide to provide emergency care at any time throughout procedure if patient shows signs of adverse reactions.

12. Performer looks at the first set of cerebral angiograms on view boxes in sequence as soon as they are processed. Places frontal and lateral views together.

   a. Checks for technical quality and notes whether any irregularities are due to artifacts or actual pathological or abnormal conditions, and whether the views are clear enough for interpretation or will be after subtraction. Performer may ask opinion of another radiologist.
   b. Performer may decide what variations in the amount of contrast, speed of the injection, and force to use for the next projection(s), depending on the information already obtained, the patient's response, and the quality of the angiograms.
   c. Performer may decide whether it would be desirable to inject more contrast and/or whether the other side of the brain or another artery should be injected, based on the information already available on the films, the way in which the patient responded to the procedure, and the patient's condition and cumulative exposure. May decide to order magnification technique at this time. If so, specifies degree of magnification.
   d. Indicates to technologist any changes required in technical factors or patient positioning. May select radiographs from which to prepare subtraction prints.
   e. Performer reviews subtraction films when ready as described above. May order second-order subtractions if image is not deemed sharp enough.

TASK DESCRIPTION SHEET (continued)

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Repeats additional review as required.

f. If the performer decides to reinject in same or another location, repeats relevant steps for repeat or additional views and locations as appropriate until satisfied. Repeats review of angiograms as described above until satisfied that the angiograms are technically adequate to demonstrate the areas and conditions under study and to provide sufficient information to make possible a competent medical interpretation.

g. Throughout procedure performer evaluates how the patient is responding.

  i) May decide to provide emergency care.

  ii) If performer notes any signs of arterial spasm, may inject an anticoagulant, and/or apply hot packs at once to avoid thrombotic occlusion.

13. Performer decides when the radiographic examination is completed based on information on the angiograms and the patient's condition. Informs anesthesiologist (if present), technologist and other staff that procedure is to be terminated.

a. Performer returns to the patient. If patient is conscious, reassures patient and explains what will happen next.

b. Removes any connecting tubes or syringes from catheter, teflon sheath or needle.

c. Performer gently and slowly withdraws the needle or catheter. Manipulates catheter by turning and pulling gently, taking care not to injure the vessel or enlarge the wound at the entry point.

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d. Performer compresses the vessel proximal to or at the puncture site with the fingertips and/or sterile gauze for an appropriate amount of time.

  i) Does not totally occlude the artery. Checks that there is a pulsation distal to the puncture site and no hematoma at the site.

  ii) May have a staff member continue the compression for the time needed. Makes changeover so as to maintain pressure by withdrawing own hands from under those of the relieving staff member once they are in place.

e. Performer applies or orders pressure dressing to be kept in place appropriate amount of time.

f. Performer may order fluids to be given intravenously or by mouth. May order appropriate bed rest for the patient (after recovery of pharyngolaryngeal reflex if general anesthesia has been involved).

g. Arranges to have puncture holes examined in follow up check. Informs patient or attending staff to report further oozing of blood or swelling.

h. Performer may order careful observation of patient including vital signs, urinary output, and skin care. May order tests, fill out order forms. May order medication.

i. Has appropriate sanitary clean up procedures carried out.

j. If requested, calls neurologist or clinician and reports preliminary results and findings.

TASK DESCRIPTION SHEET (continued)

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List Elements Fully	List Elements Fully
14. Performer records impressions of procedure on patient's chart: a. Preliminary findings. b. How patient tolerated procedure. c. Any special nursing follow-up recommended, tests ordered, records and observation required, medication, later studies ordered. d. May sign chart, requisition sheet or order forms.	

TASK DESCRIPTION SHEET

Task Code No. 398

This is page 1 of 4 for this task.

1. What is the output of this task? (Be sure this is broad enough to be repeatable.)

Decisions made on whether to go ahead with pneumoencephalography, technique, site of entry; pt. reassured; local anesthetic injected; spinal tap needle inserted; quantity of spinal tap fluid removed and sent for examination; air contrast injected into spinal canal; pneumoencephalograms ordered and assessed; additional views ordered; tomograms ordered; complete set of radiographs approved; medical impressions and follow-up recommendations recorded.

2. What is used in performing this task? (Note if only certain items must be used. If there is choice, include everything or the kinds of things chosen among.)

X-ray requisition form and pt.'s medical chart;pen; scout films, view box; sterile tray containing sterile towels, antiseptic and sterile solutions,sterile gloves, swabs, syringe and needles, local anesthetic, spinal tap needle (regular or pediatric),gauze, bandage, tubing; PEG chair (adult or pediatric); marking pencil; x-ray machine; emergency cart; manometer; millipore filter

3. Is there a recipient, respondent or co-worker involved in the task? Yes...(X) No...( )

4. If "Yes" to q. 3: Name the kind of recipient, respondent or co-worker involved, with descriptions to indicate the relevant condition; include the kind with whom the performer is not allowed to deal if relevant to knowledge requirements or legal restrictions.

Any pt. to have pneumoencephalography;attending MD; nurse:radiologic technologist;radiologist;anesthesiologist;neurologist

5. Name the task so that the answers to questions 1-4 are reflected. Underline essential words.

Conducting pneumoencephalography of any patient by deciding whether to go ahead;deciding on technique, based on review of current condition and cursory neurological examination;reassuring pt.;checking technical quality of scout film;injecting local anesthetic; inserting spinal tap needle;removing fluid;injecting air contrast medium and adjusting amount by assessing radiographs;deciding on additional views,tomography; deciding when examination is complete by viewing radiographs;recording medical impressions and needed nursing follow-up.

List Elements Fully

Performer receives the x-ray requisition form and medical chart of a patient scheduled for pneumoencephalography (PEG) (radiographic study of cerebral cortex and ventricles of the brain after injection of air or gas into subarachnoid space).

1. Performer reads patient's chart and requisition form to become familiar with case, or reviews information already seen. Reviews any prior scans and notes any medically relevant information. Notes whether patient is pregnant, has infectious or communicable condition. Notes recommendations made on technique, requests by patient's physician, and any anesthesia or anesthetic ordered. Notes whether neurologist will be present. Checks that patient or authorized adult has signed consent for procedure. If not, informs appropriate co-worker and either terminates examination or delays it until written consent is obtained, before sedation.

2. Greets patient in examination room. Reassures, answers questions. Examines patient for neurological symptoms of alertness,general state of consciousness,ability to move extremities,degree of paralysis (if any). Notes relevant body structure to evaluate recommendations on technique and site of entry. Determines whether female patient may be pregnant. Discusses case with neurologist if present.

OK-RP;RR;RR

6. Check here if this is a master sheet..(X)

TASK DESCRIPTION SHEET (continued)

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3. Performer considers whether there have been changes in the patient's condition since the decision was made to do the procedure; considers whether there are contraindications to going ahead with the procedure. May have neurologist called or discusses. Performer decides whether to proceed or not based on assessment of patient's current condition.

4. If performer decides not to proceed, records reasons and any recommendations on patient's chart. Informs appropriate coworker of cancellation; has patient returned to room. Discusses with clinician and asks for rescheduling of patient or orders alternative procedure.

   If performer decides to proceed, makes final decision on technique and site of entry. If different from requisition sheet or standard procedures,writes decision on requisition sheet and informs appropriate co-workers so that patient and materials can be prepared. Discusses timing with anesthesiologist if appropriate.

5. Performer notes whether preparatory procedures have been carried out, if ordered, such as blood pressure reading, administration of sedation, IV infusion, prior administration of anesthesia. If not already carried out, arranges to have these done or decides to do personally.

6. A scout film may be ready for the performer to read on a view box, or performer will order scout film and, after it is developed, place on view box. Assesses whether the technical quality of the film is acceptable, and whether there are masses visible in the brain. If not acceptable, performer indicates the needed adjustments to technologist.

7. If patient is coherent, performer explains what will be done. Reassures

List Elements Fully

patient and does so as deemed necessary throughout procedure.

   a. Performer checks that patient has been properly positioned (strapped) into special chair for PEG, that patient has been properly shielded, and that site of injection has been exposed. May decide to position patient personally.
   b. If general anesthesia is still to be administered, may indicate to anesthesiologist that procedure is to start; allows for appropriate timing.
   c. Checks that emergency cart is present. Checks sterile tray previously prepared for procedure. Checks that anyone to remain in room during exposure is shielded.

8. Performer chooses and marks off the appropriate lumbar area for PEG with a marking pencil. Dons sterile gloves.

   Performer swabs entire lumbar area, using prepared antiseptic solution. Wipes off excess.

9. Checks amount of local anesthetic to be injected as shown by nurse; draws anesthetic into sterile syringe. Inserts needle and injects anesthetic. Removes needle; waits for area to become anesthetized.

10. Performer inserts a spinal tap needle into entry site. (With pediatric patient uses an 18 or 20 gauge pediatric spinal tap needle.) Performer negotiates the subarachnoid space until needle is deemed properly located. Withdraws inner part of needle and checks for egress of cerebrospinal fluid. May reposition needle or reinsert until proper entry is accomplished. Wipes off blood and fluid.

TASK DESCRIPTION SHEET (continued)

Task Code No. 398

This is page 3 of 4 for this task.

List Elements Fully

11. If requested by ordering physician, performer takes reading of spinal fluid pressure by attaching manometer to needle. Reads pressure and records on patient's chart. Removes manometer.

12. Performer attaches a sterile flexible tube extension to the protruding end of the spinal needle. Removes spinal fluid in appropriate amount into sterile test tubes by allowing gravity to draw out the fluid. Notes amount and condition of fluid for recording. Has nurse cover and label test tubes and send for laboratory examination.

13. Performer prepares syringe with air contrast medium by placing sterile gauze or millipore filter on tip of empty sterile syringe and by pulling plunger back until proper amount of air has entered to replace the spinal fluid which was removed.

14. Performer inserts syringe with contrast medium into spinal tap needle and injects contrast medium into spinal canal. Removes syringe and closes off spinal tap needle (using adjustable cap) to prevent fluid seepage. Tells nurse quantities of fluid taken and medium injected (for recording).

15. Performer remains alert to patient's condition; may decide to provide emergency care, if appropriate.

16. Performer indicates to technologist when to take radiograph. Looks at radiograph on view box when it is brought or goes to automatic processor.

    a. Checks for technical quality and notes whether any irregularities are due to artifacts or actual pathological or abnormal conditions, and whether the tumor or mass is clear enough for interpretation.

List Elements Fully

Informs technologist of any needed changes in technical factors or positioning of patient.

b. Examines how far the contrast medium has traveled through the spinal canal into the subarachnoid space and ventricles of the brain in relation to clarity of film.

c. Decides whether it would be desirable to remove more fluid and inject more contrast medium. If so, examines patient's condition and decides whether to remove more fluid, considering the information on the films and the patient's tolerance of the procedure. If so decided, performer repeats the appropriate steps until satisfied that radiographs are adequate.

17. Once the technical factors are adjusted, indicates to technologist which PEG views to take with chair rotated appropriately.

18. Performer looks at pneumoencephalograms on view boxes as soon as they are processed. Determines whether they are technically adequate to demonstrate the area under study and provide sufficient information to make possible a competent medical interpretation. Performer may ask opinion of neurologist or another radiologist.

    a. Performer decides whether to order additional views or a change in the patient's position or technical factors based on the information already available, the patient's condition and his or her radiologic history.
    b. Performer may decide to order stereoscopic views.
    c. If the performer decides to order additional views, steroscopy and/or decides that any radiographs should

TASK DESCRIPTION SHEET (continued)

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This is page 4 of 4 for this task.

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be redone with a change in the technical factors, performer informs technologist, specifying what is needed. May record. May reposition patient personally.

d. Performer examines additional radiographs as above until satisfied.

19. Performer may decide to order tomography based on requisition sheet recommendation and/or reading of the pneumoencephalograms. If performer decides on tomography:

    a. Performer estimates the probable depth and level of the area to be studied based on reading of the pneumoencephalograms. Indicates to technologist the patient positions desired, the number, amplitude and the levels for the first "cuts."
    b. Performer views tomograms on view box as they are processed, until performer judges that the area under study has been localized visually.
    c. Performer selects the position, level, number, and intervening distance at which the full set of "cuts" should be made. Indicates orders to technologist. May suggest a change in technical factors.
    d. Performer views the tomograms and judges if they are technically adequate to demonstrate the area under study for medical interpretation and/or localization. Performer may decide on a level to be further defined. May decide on more cuts at shorter intervening distances for any given level and patient position. May ask for a change in technical factors. Explains what is needed to technologist.
    e. Performer examines additional tomograms as processed until satisfied with set.

20. When performer decides that sufficient interpretable views have been produced,

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performer orders a view to compare with the initial radiograph in the starting "sitting" position.

21. When the performer decides that the examination has been completed, informs the anesthesiologist (if one is present) that the procedure is terminated; informs staff.

22. Performer returns to the patient and removes needle; swabs area. Asks nurse to dress and bandage, specifying what to use. If appropriate, has decontamination and/or sanitary clean up procedures carried out.

23. Performer records impressions of procedure on patient's chart.

    a. Preliminary findings.
    b. How patient tolerated procedure.
    c. Any special nursing follow-up recommended.
    d. May sign chart or requisition sheet.

TASK DESCRIPTION SHEET

Task Code No. 399

This is page 1 of 4 for this task.

1. **What is the output of this task?** (Be sure this is broad enough to be repeatable.)

Decisions made with surgeon on whether to go ahead with brain ventriculography, on amount of air contrast to inject, on whether to do tomograms, to do positive contrast study, and amount of iodized oil to inject; complete set of ventriculograms evaluated and approved; medical impressions recorded.

2. **What is used in performing this task?** (Note if only certain items must be used. If there is choice, include everything or the kinds of things chosen among.)

X-ray requisition form and patient's medical chart; pen; scout films, view boxes; PEG chair (adult or pediatric); emergency cart

3. Is there a recipient, respondent or co-worker involved in the task? Yes...(X) No...( )

4. **If "Yes" to q. 3:** Name the kind of recipient, respondent or co-worker involved, with descriptions to indicate the relevant condition; include the kind with whom the performer is not allowed to deal if relevant to knowledge requirements or legal restrictions.

Any patient to have brain ventriculography; surgeon; referring clinician; radiologist; radiologic technologist; anesthesiologist; nursing personnel

5. **Name the task** so that the answers to questions 1-4 are reflected. Underline essential words.

Cooperating with surgeon in conducting brain ventriculography of any patient by deciding with surgeon: whether to go ahead based on review of current condition and cursory neurological examination, amount of air contrast to inject; ordering and viewing air contrast ventriculograms; deciding with surgeon whether to order tomography and/or positive contrast study based on review of processed radiographs; deciding with surgeon on amount of iodized oil to inject;ordering and viewing positive contrast ventriculograms;deciding with surgeon when examination is completed;recording medical impressions.

List Elements Fully

Performer receives the x-ray requisition form and medical chart of a patient scheduled for ventriculography of the brain (replacing of a small portion of cerebrospinal fluid by one or more contrast media, and radiography of ventricles).

1. Performer reads patient's chart and requisition form to become familiar with case, or reviews information already familiar to performer. Notes any medically relevant information.

   Notes recommendations made on technique, history of former trephining (drilling) of holes in cranial vault,and on anesthesia. Notes whether patient is pregnant or has an infectious or communicable condition.

   Checks that patient or authorized adult has signed consent for procedure. If not,informs appropriate co-worker and either terminates examination or delays it until written consent is obtained before sedation.

2. Performer greets patient in examination room. Reassures and answers questions. Examines patient for neurological symptoms of alertness,general state of consciousness, ability to move extremities, degree of paralysis (if any). Notes relevant body structure to evaluate recommendations on technique and site of en-

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6. Check here if this is a master sheet..(X)

TASK DESCRIPTION SHEET (continued)

Task Code No. 399

This is page 2 of 4 for this task.

List Elements Fully

try. If female, asks patient if she suspects she is pregnant.

Performer considers whether there have been changes in the patient's condition since the decision was made to do the procedure, and considers whether there are contraindications to going ahead with the procedure. May have clinician and/or surgeon called, and discusses patient's current condition.

Performer decides whether to proceed or not based on assessment of patient's current condition and medical history.

3. If performer decides not to proceed, records reasons and any recommendations on patient's chart. Informs appropriate co-workers of cancellation; has patient returned to room. Discusses with clinician and/or surgeon and asks for rescheduling of patient or orders alternative procedure.

4. If performer decides to proceed, makes final decision on technique and site of entry. If different from requisition sheet, writes decision on requisition sheet and informs appropriate co-workers so that patient and materials can be prepared.

5. Performer has patient prepared and returns to patient in x-ray room when informed that patient and equipment are ready. (Patient will have been sedated and will have received an IV infusion and appropriate anesthesia; blood pressure will have been taken. Equipment will have been set for appropriate technical factors, and the patient will have been positioned by the technologist, strapped into a PEG chair).

   If patient is still coherent, may explain procedures and reassure patient. Makes sure that patient has been appropriately shielded as well as anyone who will remain in room during exposure.

List Elements Fully

6. A scout film may be ready for the performer to read on a view box, or performer will order scout film and, after it is developed, place on view box. Assesses whether the technical quality of the film is acceptable, and whether there are masses visible in the brain. If not acceptable, performer indicates the needed adjustments to technologist.

7. Checks whether patient is in the correct position for the surgeon. Waits while surgeon trephins (drills) small holes in the cranial vault for insertion of needles and contrast media or opens scar areas of former ventriculography.

8. Waits until surgeon has inserted needle and injected appropriate amount of air as contrast medium. Indicates to technologist when to position x-ray tube and take radiograph.

9. Performer views radiograph on view box with surgeon when it is brought, or goes to automatic processor with surgeon.

   a. Checks for technical quality and notes whether any irregularities are due to artifacts or actual pathological or abnormal conditions, and whether the tumor or mass is clear enough for interpretation.
   b. Examines how far the air has traveled into the ventricles of the brain in relation to clarity of film and discusses with surgeon.
   c. Decides with surgeon whether it would be desirable to have more fluid removed and more air injected. If so, examines patient's condition with surgeon. Decides with surgeon whether to remove more fluid, considering the information on the radiograph, the patient's condition, radiologic history and how patient

TASK DESCRIPTION SHEET (continued)

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This is page 3 of 4 for this task.

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is tolerating the procedure. If so repeats steps described above as appropriate.
May ask the opinion of clinicians or radiologists. As decided, has surgeon reposition patient, or has technologist adjust technical factors.

10. Performer indicates to technologist which radiographs to take with chair rotated appropriately.

    As additional views are taken, performer reviews these with surgeon as above. Decides with surgeon whether to order additional views and reviews as above. Performer orders final view in the initial "sitting" position.

11. Performer consults with the surgeon regarding the desirability of ordering additional views, tomography and/or a positive contrast study (using an iodized oil) to pinpoint the location of the abnormality or to provide greater detail, based on the information already available on the ventriculograms, the patient's condition and radiographic history, and the urgency of the situation.

12. If the decision has been made to order additional views, the performer indicates to technologist what is required; has surgeon reposition patient if needed.

    Performer and surgeon view any further ventriculograms as described above, and reconsider the need for tomography and/or a positive contrast study.

13. If tomography has been agreed upon, performer estimates the probable depth and level of the mass to be studied based on the ventriculograms.

List Elements Fully

Indicates to technologist the patient positions desired, the depth, and the levels of the first "cuts." Has surgeon position patient.

   a. Performer and surgeon view tomograms on view boxes as they are processed until it is agreed that the mass under study has been localized visually.
   b. Performer selects the position, level, depth, and intervening distances at which the full set of "cuts" should be made. Indicates orders to technologist. May suggest a change in technical factors.
   c. Performer views the tomograms and judges if they are technically adequate to demonstrate the area under study for medical interpretation and/or localization. Performer may decide on a level to be further defined. May decide on more cuts at shorter intervening distances for any given level and patient position. May ask for a change in technical factors. Explains what is needed to technologist.
   d. The performer and the surgeon examine additional tomograms as processed until satisfied with the set.
   e. Performer and surgeon reconsider the need for a positive contrast study to provide more detail.

14. If a positive contrast study is agreed on, performer discusses with the surgeon the amount of iodized oil (at room temperature) to be injected.

   a. When the surgeon has injected the iodized oil, the performer indicates to technologist when to take an overhead radiograph. Has surgeon position patient as appropriate.

TASK DESCRIPTION SHEET (continued)

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This is page 4 of 4 for this task.

List Elements Fully	List Elements Fully
b. Performer and surgeon check the movement of the iodized oil medium into the ventricles and decide whether more contrast medium is needed by examining the radiograph when it is processed. c. When sufficient medium has been injected, performer has surgeon position the patient and performer indicates to technologist what views to take with the chair rotated appropriately. d. Performer and surgeon view the processed ventriculograms as described above. e. When the performer and surgeon decide that sufficient interpretable views have been produced, performer orders a view to compare with the initial radiograph in the starting "sitting" position. 15. The performer and surgeon decide when the examination has been completed. If requested by surgeon, performer assists with removal of oil contrast by assisting with lumbar puncture and use of gravity (positioning) and suction (syringe) to pool and withdraw contrast. 16. When appropriate, may indicate to anesthesiologist and technical staff that the procedure is terminated. If appropriate,has decontamination or sanitary clean up procedures followed. 17. As appropriate, performer records impressions of the procedure on the patient's chart including preliminary findings and how patient tolerated procedure. May sign chart or requisition sheet.	

TASK DESCRIPTION SHEET

Task Code No. 400

This is page 1 of 6 for this task.

1. What is the output of this task? (Be sure this is broad enough to be repeatable.)

Decisions made on whether to go ahead, on technique, on entry site; pt. reassured;local anesthetic injected; spinal tap needle inserted;spinal fluid removed; contrast medium injected into spinal canal, viewed with fluoroscopy; spot films taken; myelograms ordered; complete set of myelograms approved; contrast medium removed; medical impressions, follow-up recommendations recorded.

2. What is used in performing this task? (Note if only certain items must be used. If there is choice, include everything or the kinds of things chosen among.)

X-ray requisition form;pt.'s chart, prior radiographs;pen,view boxes;sterile tray with drape,vena tube,antiseptic and sterile solutions,swabs, syringes,needles,local anesthetic,spinal tap needle, receptacle,gauze,bandage,tubing,specimen bottle and labels;iodized oil contrast medium;fluoroscope,tilt table,spot film device,TV monitor;marking pencil; protective lead garments;sterile gown,gloves;restraining devices;shielding;emergency cart

3. Is there a recipient, respondent or co-worker involved in the task? Yes...(X) No...( )

4. If "Yes" to q. 3: Name the kind of recipient, respondent or co-worker involved, with descriptions to indicate the relevant condition; include the kind with whom the performer is not allowed to deal if relevant to knowledge requirements or legal restrictions.

Any patient to have positive contrast myelography; accompany adult;radiologist;clinician;neurologist; radiologic technologist;nurse;anesthesiologist

5. Name the task so that the answers to questions 1-4 are reflected. Underline essential words.

Conducting positive contrast myelography of any patient by deciding whether to go ahead,and on technique,based on review of current condition and examination;reassuring pt.;injecting local anesthetic; inserting spinal tap needle with fluoroscopic check; removing spiral fluid;injecting iodized oil contrast medium;observing and directing flow using tilt table and fluoroscopic control;taking spot films;ordering myelograms;approving complete set of myelograms;removing contrast medium with gravity,suction and/or additional spinal puncture;recording medical impressions and needed follow-up care.

List Elements Fully

Performer receives the x-ray requisition form and medical chart of a patient scheduled for partial or total positive contrast myelography (study of spinal canal, spinal cord and vertebrae after instillation of an iodized oil contrast medium).

1. Performer reads the patient's requisition form and relevant information to become familiar with the case or to review materials seen earlier.
   - a. Notes patient's age and sex; reviews test results and interpretation of radiographs from relevant studies done prior to this examination to become familiar with diagnostic information and the nature of the pathology suspected (usually diseases of the spinal cord).
   - b. Notes any other medically relevant information such as history of adverse reaction to iodized oil contrast material,evidence of elevated intracranial pressure, acute inflammation of the central nervous system, whether female patient may be pregnant, whether patient has an infectious or communicable condition. May call clinician or neurologist to obtain additional information.
   - c. Notes the areas to be visualized,recommendations on technique and site of spinal puncture. Notes

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6. Check here if this is a master sheet..(X)

TASK DESCRIPTION SHEET (continued)

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This is page 2 of 6 for this task.

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whether general anesthesia has been ordered (for pediatric patient).

   d. Checks to see that patient or authorized adult has signed consent for procedure. If not, informs appropriate co-worker and either has examination delayed until written consent is obtained or arranges to obtain personally before sedation.

2. Performer greets non-infant patient and any accompanying adult in examination room. Attempts to reassure; explains what will be done.

   a. May question about patient's symptoms in relation to the condition being studied. May collect additional medical history such as previous radiography, allergies.
   b. Determines whether female patient of childbearing age may be pregnant.
   c. Performer may examine the patient for neurological symptoms; may examine the site for the spinal puncture.
   d. Performer may explain or demonstrate use of equipment to a child to allay fears and enlist cooperation; answers questions. Explains that patient will be asked to hold still from time to time. Indicates how the padded shoulder braces and restraints will be used to hold patient in head-down positions from time to time.
   e. If appropriate, performer may describe the procedure and its risks and obtain consent signature from patient or authorized adult. (Does not proceed without signed consent.)

3. Performer notes whether there are contraindications to going ahead with the procedure based on medical records and clinical evidence. May call clinician or neurologist and discuss patient's current condition and any alternative steps.

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4. If performer decides not to proceed, records reasons and any recommendations on patient's chart. Informs appropriate co-worker of cancellation and has patient returned to room. If appropriate, orders rescheduling of patient or scheduling for alternative procedure.

5. If performer decides to proceed, orders scout film; reads on view box as soon as processed. Determines whether the patient's position and technical factors are adequate to provide diagnostic information. Indicates to technologist any needed adjustments in technique or positioning.

6. With pediatric patient performer may consider whether general anesthesia (if suggested) is still warranted;may decide to order if patient's behavior and condition suggest the need. If general anesthesia is to be carried out, performer discusses with anesthesiologist when it is to be performed and awaits indications from anesthesiologist as to when to proceed.

7. Performer makes final decision on entry site and technique, based on review of requisition sheet, own examination of patient and scout film.

   a. Selects iodized oil contrast medium and estimates amount required based on the patient's size. May have contrast heated to room temperature.
   b. Orders appropriate size puncture needle.
   c. Informs appropriate co-workers of decisions so that patient and materials can be prepared.
   d. Has technical factors set for fluoroscopy. If the spot film attachment uses cassettes, performer has

TASK DESCRIPTION SHEET (continued)

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This is page 3 of 6 for this task.

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cassette inserted. Chooses full, half or quarter format and sets as appropriate. (If roll film attachment, checks that attachment is loaded with film or has this done.)

e. Performer dons protective lead garments and sterile gown and gloves when appropriate.

8. When informed that patient and equipment are ready, performer checks whether patient has been properly immobilized and prepared for the puncture on tilt table:

   a. Checks that all materials needed and emergency cart are present, that correct drugs and sizes of items are present. Checks appearance of contrast medium to be sure there is no chemical deterioration.
   b. Checks that patient and others in the room have been properly shielded. May decide to immobilize patient personally.
   c. Performer has any needed changes or adjustments made.

9. Performer prepares for the spinal puncture:

   a. With patient in appropriate position, performer chooses and marks off the intervertebral area selected for the spinal puncture with a marking pencil.
   b. Swabs area with prepared antiseptic solution. Wipes off excess. Covers surrounding areas with sterile drape.
   c. Performer checks amount of local anesthetic in sterile syringe or draws up personally in amount required. Expels air in syringe. Inserts needle into area intradermally and subcutaneously. Injects anesthetic. Removes needle and waits for area to become anesthetized.

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   d. Performer prepares spinal tap needle by assembling as appropriate. Fills a sterile syringe with iodized oil contrast medium. Checks quantity. Lays assembled needle and syringe on sterile tray.
   e. Performer positions fluoroscope unit over entry site. May have lights in room dimmed. Activates fluoroscope and has technical factors and unit position adjusted until area of interest is optimally visible on TV monitor. Shuts fluoroscope.

10. The performer positions the spinal tap needle at the exact site of entry at the appropriate angle. Has patient hold still while performer inserts needle. Checks for a characteristic "give" as the dura is passed.

   a. Performer negotiates the subarachnoid space until the needle is deemed properly located.
   b. Checks needle placement on TV monitor and adjusts as deemed necessary.
   c. Withdraws inner part of needle and checks for egress of spinal fluid. May repeat procedure until proper entry is accomplished. Shuts fluoroscope. Wipes away blood and fluid.

11. Performer attaches a sterile rubber tube extension to the protruding end of the spinal needle.

   a. Removes spinal fluid (in amount proportionate to the contrast medium to be introduced) by attaching a sterile syringe to the rubber tube extension and allowing gravity to draw out the fluid.
   b. Ejects fluid into sterile container. Notes amount and condition of fluid for recording. Has nurse close and label container.

TASK DESCRIPTION SHEET (continued)

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This is page 4 of 6 for this task.

List Elements Fully

12. Performer adjusts table to horizontal position and checks needle position.

    a. Inserts syringe with contrast medium into spinal tap needle and injects a small trial amount of contrast medium into spinal canal.
    b. Activates fluoroscope and observes the contrast medium to make sure that it is in the liquor (subarachnoid) space. Shuts fluoroscope. Adjusts as needed.
    c. Removes syringe and closes off spinal tap needle (using adjustable cap) to prevent seepage.

13. When satisfied that needle position is appropriate for the instillation, performer has the patient positioned for the instillation and restrained securely so that table can be tilted as needed.

    a. Performer again attaches the syringe with the contrast medium to the spinal tap needle.
    b. While observing on TV monitor, performer injects the contrast into the subarachnoid space using appropriate pressure.
    c. Performer observes the filling of the lumbar, thoracic and/or cervical subarachnoid spaces, depending on the areas of interest; moves the tilt table as appropriate to direct the flow while observing on the TV monitor.
    d. Performer makes sure patient's chin is jutting upward to keep contrast medium from entering skull.

14. Performer intermittantly injects the contrast medium, watches the progress of the medium, positions table to appropriate angles of inclination, and simultaneously moves the fluoroscope unit over the areas of the canal to be studied. Notes areas showing symptoms of pathology on TV monitor.

List Elements Fully

    a. Performer may have co-worker adjust inclination of table or may have co-worker position fluoroscope to various positions as needed.
    b. Performer decides what to record with spot films while viewing on monitor. Activates spot film attachment and x-ray button as appropriate. If cassette attachment,may have technologist remove cassette as spots are snapped and insert additional cassettes, or performer does so personally.
    c. When satisfied that sufficient contrast has been instilled, performer closes off puncture needle and covers with radiolucent protective bandage.
    d. Throughout procedure performer remains alert for symptoms of adverse reaction to procedure. Performer may decide to provide emergency care.

15. Performer decides when fluoroscopy is completed. Shuts fluoroscope. Tells technologist when to take radiographs. Decides on and indicates what portions of the spinal cord, angles,and number of views to take.

16. Performer looks at myelograms and spot films on view box when they are brought or goes to automatic processor to read them:

    a. Checks for technical quality and notes whether any irregularities are due to artifacts or actual pathological or abnormal conditions, and whether the views are clear enough for interpretation.
    b. Determines whether the films adequately demonstrate the areas being examined and provide enough information to make possible a competent medical interpretation. Performer

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This is page 5 of 6 for this task.

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may ask opinion of another radiologist or neurologist.

c. Decides whether it would be desirable to redo any portion of the procedure, including injection of additional contrast medium, taking views at additional angles.

d. Performer examines patient's condition and decides whether redoing any portion of the procedure is compatible with the patient's condition and radiologic history.

e. If decision is to repeat any portion, proceeds as in appropriate earlier steps. Informs technologist of any needed changes in technical factors or positioning. Orders new views as appropriate. Performer decides when an adequate set of films has been produced.

f. If performer decides that an acute surgical problem has been discovered, performer marks patient's skin at the appropriate level and notifies referring physician and/or neurosurgeon.

17. Performer prepares for removal of the contrast medium from the spinal canal by turning the table to 45°, attaching empty syringe, and activating the fluoroscope.

    a. Checks that the column of contrast has pooled at the puncture site.
    b. Performer increases inclination of table and pulls back on the syringe plunger so that the contrast medium (heavier than the spinal fluid) will drain out by gravity and suction. Performer notes progress by looking at the image of the medium on the TV monitor.
    c. If blockage occurs which prevents the free passage of the medium out of the canal, performer may decide to do any or all of the following, usually in the following order as needed:

List Elements Fully

i) Performer uses fluoroscope to determine the location of the blockage. May ask the advice of other physicians.

ii) Performer may decide to use suction method. Attaches an additional (vena) tube to the syringe attached to the spinal tap needle, and uses the syringe plunger to obtain a greater suction effect on the medium to draw it out of the canal.

iii) Performer may decide, after viewing on TV monitor and/or consultation, that the remaining amount of contrast medium is not intolerable and is less dangerous than further removal efforts.

iv) Performer may decide to effect removal via a new puncture above or below the point of blockage. Chooses the new space between two vertebrae and repeats appropriate steps as described above to insert needle at new site. Allows contrast medium to pass into a receiving cup via a tube connected to the syringe attached to needle.

v) May order overhead radiograph to demonstrate extent of removal.

18. When performer decides that the contrast medium has been satisfactorily removed, shuts fluoroscope.

    a. Informs staff and anesthesiologist, if present, that examination is completed.
    b. Performer reassures patient and explains what will happen. Gently removes the spinal tap needle; swabs area.
    c. Asks nurse to dress and bandage puncture site, specifying what to use. Has appropriate,sanitary clean up procedures carried out.

TASK DESCRIPTION SHEET (continued)

Task Code No. 400

This is page 6 of 6 for this task.

List Elements Fully	List Elements Fully
19. Performer records impressions of procedure on patient's chart: a. Preliminary findings. b. How patient tolerated procedure. c. Any special nursing follow-up recommended. d. May sign chart or requisition sheet.	

TASK DESCRIPTION SHEET

Task Code No. 401

This is page 1 of 4 for this task.

1. What is the output of this task? (Be sure this is broad enough to be repeatable.)

Decisions made on whether to go ahead with air contrast myelography, on technique, and on site of entry; pt. reassured; local anesthetic injected; spinal tap needle inserted; fluid pressure recorded; spinal tap fluid removed; appropriate amount of air injected into spinal canal; myelograms ordered and assessed; additional views ordered; tomograms ordered; complete set of myelograms approved; medical impressions and follow-up recommendations recorded.

2. What is used in performing this task? (Note if only certain items must be used. If there is choice, include everything or the kinds of things chosen among.)

X-ray requisition form and pt.'s medical chart; pen; scout films, view boxes; sterile tray with sterile towels, antiseptic and sterile solutions, sterile gloves, swabs, syringes and needles, local anesthetic, spinal tap needle (regular or pediatric), gauze, bandage, tubing; specimen bottle and labels; tilt table; marking pencil; protective lead garments; emergency cart

3. Is there a recipient, respondent or co-worker involved in the task? Yes...(X) No...( )

4. If "Yes" to q. 3: Name the kind of recipient, respondent or co-worker involved, with descriptions to indicate the relevant condition; include the kind with whom the performer is not allowed to deal if relevant to knowledge requirements or legal restrictions.

Any patient to have air contrast myelography; radiologic technologist; radiologist(s); nurse; referring MD; neurologist

5. Name the task so that the answers to questions 1-4 are reflected. Underline essential words.

Conducting air contrast myelography of any patient by deciding whether to go ahead; deciding on technique, based on review of current condition and cursory neurological examination; reassuring pt.; checking technical quality of scout film; injecting local anesthetic; inserting spinal tap needle, removing fluid; injecting air as contrast medium; ordering and assessing myelograms; deciding on additional views; ordering and assessing tomograms; deciding when examination is complete; recording medical impressions and needed nursing follow-up.

List Elements Fully

Performer receives the x-ray requisition form and medical chart of a patient scheduled for partial or total air contrast myelography (radiographic and tomographic study of spinal canal, spinal cord and vertebrae after injection of air as contrast medium).

1. Performer reads patient's chart and requisition form to become familiar with case, or reviews information already familiar to performer. Notes any medically relevant information. Notes any recommendations made on technique and site of injection. Notes whether female patient may be pregnant, whether patient has an infectious or communicable condition.

   Performer checks to see that patient has signed consent for procedure. If not, informs appropriate co-worker and either terminates examination or has it delayed until written consent is obtained before sedation.

2. Performer greets patient in examination room. Reassures patient and answers questions as appropriate. Examines patient for neurological symptoms. Notes relevant body structures to determine best technique and site of entry. Asks female patient whether she thinks she may be pregnant.

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6. Check here if this is a master sheet..(x)

TASK DESCRIPTION SHEET (continued)

Task Code No. 401

This is page 2 of 4 for this task.

List Elements Fully

Performer considers whether there have been changes in the patient's condition since the decision was made to do the procedure, and considers whether there are contraindications to going ahead with the procedure. May have clinician called, and discusses patient's current condition. Decides whether to proceed or not based on assessment of patient's current condition and/or medical information.

3. If performer decides not to proceed, may discuss with clinician. Records reasons for cancellation and any recommendations such as alternative procedure on patient's chart. Informs staff of cancellation and has patient returned to room.

4. If performer decides to proceed, makes final decision on entry site and technique, based on review of requisition sheet and own examination of patient. If site or technique are different from those recommended on requisition sheet or standard procedure, performer writes decisions on requisition sheet and informs appropriate co-workers so that patient and materials can be prepared.

5. Performer has patient prepared; checks that patient has been sedated, and that x-ray and fluoroscope have been set for appropriate technical factors by technologist.

6. A scout film may be ready for the performer to read on a view box, or performer orders scout film and, after it is processed, places on view box to assess whether the technical quality of film is acceptable for interpretation. If not acceptable, performer indicates the needed adjustments to technologist.

7. If patient is able to comprehend, performer explains what will be done. Reassures patient and does so as deemed to be necessary throughout procedure.

List Elements Fully

8. Performer checks whether patient has been properly shielded and immobilized and that the site of the injection has been exposed. If not acceptable, performer indicates the needed adjustments. Checks sterile tray previously prepared for procedure. Checks that emergency cart is present. Requests any missing objects.Checks that anyone to remain in room is shielded. Performer dons protective lead garments and sterile gown.

9. Performer chooses and marks off the appropriate lumbar area for puncture with a marking pencil. Dons sterile gloves.

   Performer swabs entire lumbar area using prepared antiseptic solution. Wipes off excess.

10. Asks to have container with local anesthetic opened. Inserts needle of sterile syringe and draws up anesthetic into syringe in the amount required. Inserts needle and injects anesthetic. Removes needle and swabs with sterile solution. Waits for area to become anesthetized.

11. Performer prepares syringe with air contrast medium by placing sterile gauze on tip of empty sterile syringe and pulling plunger back until proper amount of air has entered to replace the spinal fluid to be removed. Lays syringe on tray.

12. Performer positions overhead fluoroscope unit over entry site for puncture. Performer locates the exact site of entry and inserts spinal tap needle into site. (With pediatric patient, uses an 18 or 20 gauge pediatric spi-

TASK DESCRIPTION SHEET (continued)

Task Code No. 401

This is page 3 of 4 for this task.

List Elements Fully

nal tap needle.) Performer negotiates the subarachnoid space until needle is deemed properly located. Activates fluoroscope and checks needle placement on TV monitor; adjusts as deemed necessary. Withdraws inner part of needle and checks for egress of fluid. May repeat procedure until proper entry is accomplished. Shuts fluoroscope. Wipes away blood and fluid.

13. Performer attaches a sterile rubber tube extension to the protruding end of the spinal needle.

14. Removes spinal fluid in amount required by attaching a sterile syringe to the rubber tube extension and allowing gravity to draw out the fluid. Removes syringe and ejects fluid into sterile container. Notes amount and condition of fluid for recording. Has nurse close and label container. May reread and record spinal fluid pressure as described above.

15. Performer adjusts table so that patient's feet are in the up position to keep the air to be injected from entering the skull. Performer judges when to inject the air.

16. Performer inserts syringe with air contrast medium into spinal tap needle and injects air into spinal canal. Removes syringe and closes off spinal tap needle (using adjustable cap) to prevent seepage. May have nurse record quantity of fluid taken and air injected.

17. Performer remains alert to patient's reactions to procedure. May decide to provide emergency care.

18. Performer indicates to technologist when to take radiographs. Decides on and indicates what portions of the

List Elements Fully

spinal cord, angles and number of views to take.

19. Performer looks at the myelograms on view boxes when they are brought or goes to automatic processor to read them.

    a. Checks for technical quality and notes whether any irregularities are due to artifacts or actual pathological or abnormal conditions, and whether the myelograms are clear enough for medical interpretation. Informs technologist of any needed changes in technical factors or positioning of patient.
    b. Decides whether it would be desirable to remove more fluid and inject more air. If so, examines patient's condition and decides whether to remove more fluid, considering the information on the films and the patient's tolerance of the procedure. If so decided, performer repeats the appropriate steps until satisfied that radiographs are adequate.

20. Performer orders tomography based on reading of the myelograms:

    a. Performer estimates the probable depth and level of the mass to be studied. Indicates to technologist the patient positions desired, the number, amplitude and the levels of the first "cuts."
    b. Performer views tomograms on view boxes as they are processed until performer judges that the area under study has been localized visually.
    c. Performer selects the position, level,number, and intervening distances at which the full set of

TASK DESCRIPTION SHEET (continued)

Task Code No. 401

This is page 4 of 4 for this task.

List Elements Fully	List Elements Fully

"cuts" should be made. Indicates orders to technologist. May suggest a change in technical factors.

d. Performer views the tomograms and judges if they are technically adequate to demonstrate the area under study for competent medical interpretation and/or localization. Performer may decide on a level to be further defined. May decide on more cuts at shorter intervening distances for any given level and patient position. May ask for a change in technical factors. Explains what is needed to technologist. May consult clinician or another radiologist.

e. Performer examines additional tomograms as processed until satisfied with set.

21. When the performer decides that the examination has been completed, informs technologist that the procedure is terminated, Returns to patient and reassures. Removes the tubing and then gently removes the spinal tap needle; swabs area. Asks nurse to dress and bandage, specifying what to use. If appropriate, has decontamination or sanitary clean up procedures followed.

22. Performer records impressions of procedure on patient's chart:

    a. Preliminary findings.
    b. How patient tolerated procedure.
    c. Any special nursing follow-up recommended.
    d. May sign chart or requisition sheet.

TASK DESCRIPTION SHEET

Task Code No. 402

This is page 1 of 2 for this task.

1. What is the output of this task? (Be sure this is broad enough to be repeatable.)

Patient reassured; patient's breasts examined; decision made on views to order; completed mammograms approved; medical impressions recorded; MD notified of emergency signs.

2. What is used in performing this task? (Note if only certain items must be used. If there is choice, include everything or the kinds of things chosen among.)

X-ray requisition form;pen

3. Is there a recipient, respondent or co-worker involved in the task? Yes...(X) No...( )

4. If "Yes" to q. 3: Name the kind of recipient, respondent or co-worker involved, with descriptions to indicate the relevant condition; include the kind with whom the performer is not allowed to deal if relevant to knowledge requirements or legal restrictions.

Any patient to have mammography;radiologic technologist; referring MD

5. Name the task so that the answers to questions 1-4 are reflected. Underline essential words.

Conducting mammographic examination of any patient's breasts, by reviewing history, physically examining; deciding on views to have taken; reassuring patient; ordering radiographs; evaluating radiographs or xeroradiographs for technical quality and deciding when there is a completed set; recording medical impressions; notifying MD of emergency signs.

List Elements Fully

Performer receives requisition form for out-patient (and sometimes in-patient) mammography (x-ray of the breasts), including comments on the case from the requesting physician. These may be for a periodic examination or because of a suspected malignancy.

1. Performer reads patient's chart and requisition form to become familiar with the case and the suspected condition in order to determine what to be alert for. Notes whether female patient may be pregnant or has infectious or communicable condition.

2. Performer enters mammography room and greets patient. Reassures and calms patient as deemed necessary, and, if this was not already done, instructs patient to undress. May explain procedure.

3. Performs manual examination of breasts, holding each in upturned palm and feeling for lumps, hard spots or other symptoms. Repeats with patient lying down. Visually inspects; compares breasts.

   Performer may question female patient about history or converse to calm patient. Inquires whether female thinks that she may be pregnant. Records findings on requisition sheet.

OK-RP;RR;RR

6. Check here if this is a master sheet..(X)

TASK DESCRIPTION SHEET (continued)

Task Code No. 402

This is page 2 of 2 for this task.

List Elements Fully	List Elements Fully
If patient requests this, performer explains to patient how to self-examine breasts; may demonstrate. 4. Performer indicates to technologist when to take standard breast views. May decide on and order additional views. May remain and help position patient. 5. When processed radiographs (or xeroradiographs) are ready, performer views these in office or near processor. Looks at radiographs on view box; looks at xeroradiographs (positives) without light source. Performer assesses: a. Whether technical quality is adequate. If not, indicates to technologist what to do to correct. b. Whether the mammograms provide enough information to make possible a competent medical interpretation. If not, performer orders additional views and specifies what is needed in technique or positioning. May help position patient. c. Reviews new mammograms as described above. 6. Performer decides when the examination is completed and indicates whether and when patient can leave. If results are negative, performer may decide to relieve patient's anxiety and report results immediately. If emergency signs are evident, may notify patient's physician at once. If appropriate has sanitary clean up procedures followed. 7. Performer records impressions of procedure on patient's chart or decides to dictate report to clinician at once. May sign requisition sheet.	

TASK DESCRIPTION SHEET

Task Code No. 403

This is page 1 of 2 for this task.

1. What is the output of this task? (Be sure this is broad enough to be repeatable.)

Mammographic film material read, interpreted; conclusions drawn and recommendations made orally or dictated; physician called about emergency signs; selected radiographs earmarked for study or library use; material rejacketed; report placed for typing.

2. What is used in performing this task? (Note if only certain items must be used. If there is choice, include everything or the kinds of things chosen among.)

X-ray requisition forms; current mammograms; view box; ruler; magnifying glass; prior radiographs; telephone; dictation equipment

3. Is there a recipient, respondent or co-worker involved in the task? Yes...(X) No...( )

4. If "Yes" to q. 3: Name the kind of recipient, respondent or co-worker involved, with descriptions to indicate the relevant condition; include the kind with whom the performer is not allowed to deal if relevant to knowledge requirements or legal restrictions.

Ordering physician; co-worker(s) in mammography asking opinions

5. Name the task so that the answers to questions 1-4 are reflected. Underline essential words.

Reading, interpreting and making recommendations on mammographic materials, or giving opinions to co-workers by reviewing medical information and requisition sheet, evaluating new and old films; notifying ordering physician of emergency signs; explaining opinions or dictating findings and recommendations; and placing report for typing.

List Elements Fully

Performer reads and interprets completed sets of mammograms (radiographs and/or xeroradiographs) or provides opinions to co-workers, when requested, on the interpretation and conclusions regarding the mammography they are doing.

1. If responding to request, performer goes to where radiographic material is on view. Listens while co-worker explains problem on how to proceed next or problem of interpretation.

   If reading and interpreting own completed set, performer obtains patient's jacketed requisition sheet, current mammograms (radiographs and/or xeroradiographs) and any earlier ones available. Goes to reading area.

2. Asks about, reads, or reviews X-ray requisition form and material on patient's medical history (reason for request, comments from ordering physician, and notes made during the procedure).

   If reading and interpreting own work, places mammograms and radiographs on view box and reads xeroradiographs under direct light. May look at earlier films. If responding to request, may ask to see earlier films. May use ruler.

3. Performer comes to a conclusion about the medical meaning of the mammograms.

OK-RP;RR;RR

6. Check here if this is a master sheet..(X)

TASK DESCRIPTION SHEET (continued)

Task Code No. 403

This is page 2 of 2 for this task.

List Elements Fully

a. Decides whether any abnormalities, changes, or suspicious signs warrant the immediate attention of the patient's physician. If so, telephones physician at once and discusses findings (or recommends that co-worker in charge of case do this).
b. For own work, decides what to report and what recommendations to make. May ask opinion of co-worker.
c. In response to request, decides what to recommend to co-worker. Explains interpretation and recommendations verbally, indicating how conclusions were arrived at, including medical and technical considerations.

4. Performer dictates findings (for own work) by explaining what appears on the films. Describes worrisome or suspicious signs, obvious abnormalities and/or changes over time, referring to earlier films. (Might indicate presence of artifacts which do not have medical significance).

   Indicates what implications can be drawn from findings and what conclusions and/or courses of action are warranted, including need for additional studies, tests, or courses of treatment.

   Dictates report in the style: There is...on.... It has the characteristics of.... I believe that this indicates.... This could mean that.... It is necessary to determine whether.... This can be done by....

5. May decide whether mammograms are unusual or of special interest, warranting inclusion into the museum library or to be used by residents for study purposes. Marks jackets appropriately if so decided.

List Elements Fully

6. Returns own patient's mammograms, requisition sheet and tape of dictation to proper jacket holder and places to be picked up for typing.

TASK DESCRIPTION SHEET

Task Code No. 404

This is page 1 of 4 for this task.

1. **What is the output of this task?** (Be sure this is broad enough to be repeatable.)

Neuroradiographic film material, C.T.T. scans read, interpreted; medical conclusions drawn and recommendations made orally or dictated; pt.'s physician called about emergency signs; selected radiographs or scans earmarked for study or library use; material rejacketed; report placed for typing.

2. **What is used in performing this task?** (Note if only certain items must be used. If there is choice, include everything or the kinds of things chosen among.)

X-ray requisition forms;current neuroradiograms, C.T.T. scans as photographs of displays,computer print-outs;other diagnostic information;view boxes;C.T.T. viewing unit;TV monitor;prior and collateral radiographic materials;magnifying glass;pen;ruler;protractor;anatomical reference chart;absorption coefficient chart;telephone; dictation equipment;stereo viewer

3. Is there a recipient, respondent or co-worker involved in the task? Yes...(X) No...( )

4. **If "Yes" to q. 3:** Name the kind of recipient, respondent or co-worker involved, with descriptions to indicate the relevant condition; include the kind with whom the performer is not allowed to deal if relevant to knowledge requirements or legal restrictions.

Co-worker(s) in neuroradiology, eurologists,or neurosurgeons asking opinions;referring physician

5. **Name the task** so that the answers to questions 1-4 are reflected. Underline essential words.

Reading,interpreting and making recommendations on neuroradiographic materials,and/or giving opinions to clinicians or co-workers by reviewing medical information and requisition sheet(s);evaluating current and prior radiographs,computerized transverse axial tomographic scans on display tube, photographs of scans,or as computer print-outs; evaluating in connection with clinical data;notifying referring physician of emergency signs;explaining opinions or dictating findings and recommendations;placing report for typing.

List Elements Fully

Performer reads and interprets completed sets of radiographs (including computerized transverse axial tomographic scans) for neuroradiographic procedures, or provides opinions to co-workers, neurologists,or neurosurgeons, when requested, on interpretation and conclusions regarding the radiographic materials.

1. Performer prepares to view the materials:
   a. If responding to request, performer goes to where radiographic material is on view (such as on view boxes, on TV monitor, or where viewing unit is located for computerized transverse axial scans (C.T.T. scans). Listens while co-worker explains problem regarding how to proceed next, or problem of interpretation. May ask to see requisition sheet, clinical data, prior diagnostic materials, collateral data.
   b. If reading and interpreting own completed work, performer obtains the jacketed radiographic materials, any photographed C.T.T. displays and/or C.T.T. computer print-outs, requisition forms and notes. Includes related diagnostic materials, any results of clinical tests, EEG and lab tests, the relevant requisition sheets, and other prior

OK-RP;RR;RR

6. Check here if this is a master sheet..(X)

TASK DESCRIPTION SHEET (continued)

Task Code No. 404

This is page 2 of 4 for this task.

List Elements Fully

radiographs or scans if available. May obtain C.T.T. absorption coefficient chart(s).

c. In viewing radiographs goes to reading and viewing area and sets up radiographic materials on view boxes. Views serial films in sequence; places bi-plane views together. Places prior films in sequence to make comparisons over time; uses stereo viewer for stereo films.

d. In viewing C.T.T. scans performer goes to viewer or reading area, depending on whether performer wishes to work directly with information on magnetic tape or disc, or will interpret from photographs of scans and/or computer print-outs.

  i) Performer may examine photographs of the cathode ray tube displays. Notes "window width" used for scaling.

  ii) Performer may examine the printed computer output in a format shaped roughly as the slice,with relative numerical density values printed out.

  iii) May go to viewer and have the scan information called from magnetic tape or disc if performer decides there is need to obtain additional information by altering the scaling.
  Adjusts picture brightness and contrast controls to appropriate range or "window width" for the area of interest and type of pathology suspected.
  Depending on equipment, may select a color coded key for display. May use selector to blacken all picture elements at a given range or to have elements in a given range "flicker." May use magnification or other options.

  ii) May have additional photographs of scans made.

List Elements Fully

  v) Performer orients point of view to concept of looking directly down on a cross-section of the skull,and then reviews as with radiographs.

e. Identifies relevant structures, their shape, size and position.

2. Performer asks about, reads, and/or reviews all the relevant case material.

a. Notes reason for request, area of interest, patient's age, sex, weight, height, clinical symptoms.

b. Notes decisions made during the procedure on technique.

  i) With conventional or transverse axial tomograms,notes level, reference line, related information, whether contrast was infused to provide density enhancement of tissue.

  ii) With completed work notes preliminary notes recorded during or just after procedure was done.

c. May use ruler and/or protractor and anatomical reference chart. For C.T.T. scans refers to standard chart giving relative coefficients of absortion for various types of tissues, water, gas and fat.

3. Performer evaluates the material to determine whether there is adequate information to make possible a competent medical interpretation.

a. Notes whether any irregularities are due to artifacts or actual pathological or abnormal conditions.

TASK DESCRIPTION SHEET (continued)

Task Code No. 404

This is page 3 of 4 for this task.

List Elements Fully

List Elements Fully

- i) For C.T.T. scans may note whether artifacts may be due to presence of high density inserts in skull, such as clips, remains of prior contrast, effects of computer averaging where there is abrupt drop from high density tissue, such as bone, next to low density material such as cerebral fluid.
- ii) Notes whether results may be distorted due to patient movement.

b. Performer interprets C.T.T. scans by comparing results of scans with standards on differential densities.

- i) Interprets white areas as tissues of highest density, black areas as tissues of lowest density, with greys intermediary. Interprets color display in terms of code selected for each given density.
- ii) Interprets alterations of normal tissue density in terms of the pathological changes known to produce such alterations.
- iii) Takes account of effects on tissue density of injection of contrast material.
- iv) Interprets data for the purpose requested, such as identification of lesions arising from trauma, cerebro-vascular accidents, difference between hemotoma, edema, hemorrhage, infarction; compares two hemispheres for symmetry.
- v) Interprets data in the light of the clinical evidence.

c. Determines whether the radiographs adequately demonstrate the vessels and structures being studied.

d. May evaluate whether the radiographs provide consistent and reproducible evidence of pathology or structural details given the purpose of the examination.

e. Determines whether the radiographs provide sufficient information about any pathology, blockage, the extent and location of any anomalies, malformation, the presence of aneurysms, emboli, thrombi and/or other signs of abnormal structure or pathology, or the location of structures being examined or evaluated.

4. Performer notes or explains what is being demonstrated on the radiographs and/or scans in relation to the purpose of the study.

   a. If performer is preparing own report, decides what is relevant.
   b. If performer is answering co-workers questions, focuses on the coworker's problem in relation to what is evident on the film(s) or display.
   c. In each case, performer describes what appears; explains implications. Points out abnormalities. (May explain idiosyncratic artifacts due to technique.) Performer may consider and/or refer to changes over time, referring or switching to earlier materials.
   d. Performer answers any questions asked as appropriate so as to make meaning unambiguous.

5. Performer decides what conclusions can be drawn, what recommendations to make, and what to report (orally if answering request, or dictated if required for report).

   a. Decides whether any abnormalities or changes warrant the immediate attention of the patient's physician. If so, telephones physician

Task Code No. 404

This is page 4 of 4 for this task.

List Elements Fully	List Elements Fully
at once and discusses findings, or makes recommendations to co-worker. b. Explains interpretation and recommendations. Indicates how conclusions were arrived at, including medical and technical considerations. c. Indicates what implications can be drawn from findings and what conclusions and/or courses of action are warranted, including need for additional studies, tests, or courses of treatment. 6. Performer dictates findings (for own work) by explaining what appears on the films. Describes worrisome or suspicious signs, obvious abnormalities and/or changes over time, referring to earlier films. (Might indicate presence of artifacts which do not have medical significance.) Dictates report in the style: There is...on.... It has the characteristics of.... I believe that this indicates.... This could mean that.... It is necessary to determine whether.... This can be done by.... 7. When performer has completed interpretation, arranges to have materials returned, including jacketed material, requisition sheets and other case history materials. a. If interpreting own materials for report, may decide whether any of the material is unusual or of special interest and warrants inclusion in museum library, or should be used for study purposes. Marks appropriately if so decided. b. Returns own patient's radiographic material, requisition sheet and tape of dictation to proper jacket, and places to be picked up for typing.	

TASK DESCRIPTION SHEET

Task Code No. 405

This is page 1 of 2 for this task.

1. What is the output of this task? (Be sure this is broad enough to be repeatable.)

Radiology resident shown and explained neuroradiologic procedures; resident evaluated for readiness to do activities under supervision; resident observed and criticized; resident evaluated for readiness to do tasks without direct supervision; resident's work spot checked; questions answered; opinions on work given as requested; evaluation noted informally.

2. What is used in performing this task? (Note if only certain items must be used. If there is choice, include everything or the kinds of things chosen among.)

X-ray requisition forms; materials and equipment needed for procedures in neuroradiology; related radiographs; view boxes;ultrasonograms, radioisotope brain scans, computerized transverse axial tomographic scans; EEG reports

3. Is there a recipient, respondent or co-worker involved in the task? Yes...(x) No...( )

4. If "Yes" to q. 3: Name the kind of recipient, respondent or co-worker involved, with descriptions to indicate the relevant condition; include the kind with whom the performer is not allowed to deal if relevant to knowledge requirements or legal restrictions.

Radiology resident to be instructed in neuroradiologic procedures;any patient involved;surgeon;supervisor of resident

5. Name the task so that the answers to questions 1-4 are reflected. Underline essential words.

Providing clinical training for radiology residents in neuroradiology procedures by demonstrating procedures, explaining what is being done, answering questions; deciding when residents can perform tasks under direct supervision; observing and correcting; deciding when tasks can be done without direct supervision; spot checking and correcting; advising as requested or as deemed necessary.

List Elements Fully

Performer provides clinical training to residents in radiology in the area of neuroradiology, covering choice of neuroradiologic procedures,including cerebral angiography, pneumoencephalography, ventriculography, myelography, angiography of spinal cord, posterior fossa, conventional tomography and/or computerized transverse axial scans, manual examination, medical aspects of procedures, interpretation of radiographic material, and possible recommendations and treatments.

1. Performer provides demonstration, explanation, informal evaluation and supervision in: reading requests for neuroradiographic procedures,how to decide on best procedure, what to look for, contraindications, medical and technical procedures available, choice of anesthetics, surgical entry, type of contrast media, technical equipment, positions and angles, technical and medical interpretation of radiographic materials, range of medical conclusions that can be drawn,additional tests, and courses of treatment to consider.

2. When performer is assigned a resident, may select times, patients, and procedures to demonstrate, and may explain to resident while performer carries out own tasks in neuroradiology:

OK-RP;RR;RR

6. Check here if this is a master sheet..(X)

TASK DESCRIPTION SHEET (continued)

Task Code No. 405

This is page 2 of 2 for this task.

List Elements Fully

a. Performer explains what will be taught.

b. Performer may narrate the steps, may explain what is being done, or may explain the basis for decisions and actions.

c. Performer may decide to solicit questions to find out what the resident understands, may answer questions, or may elaborate on the explanation of what is being done, concentrating on the relevant skills and knowledges.

d. Performer decides when the resident has observed sufficiently and has a clear enough understanding of a procedure to carry it out under close, direct supervision and/or to assist.

3. Performer supervises and observes resident carrying out activities assigned.

a. Performer asks the resident to do all or part of a procedure and remains at the side of the patient or carries out own portion and watches the resident perform the assigned activity.

b. While observing, performer decides whether the activity is being done properly, whether there is a specific problem, whether there is need to demonstrate the procedure again or explain, and does so.

c. Performer may comment on the performance, encourage or correct as deemed necessary, or do this later.

d. Performer may decide to intervene and take over the procedure, explaining to the resident what was done incorrectly at that point or later.

e. If decision is to demonstrate again, performer may redo and have the resident observe, or have resident repeat the procedure until it is done properly.

List Elements Fully

f. Performer decides which procedures or activities can be done by the resident without direct supervision (although radiologist remains responsible). Informs proper supervisors; notes for own use, and/or tells this to resident.

4. Performer spot checks resident carrying out activities without direct supervision or responds to requests for guidance, assistance or further instruction.

Performer proceeds as in steps 2 or 3 as appropriate, observing, noting areas needing improvement, determining nature of problem, assisting, giving opinions, answering questions, and providing further instruction on how to deal with unusual circumstances. Reinforces correct work. Suggests areas for improvement.

5. When patients are present for demonstrations, performer may explain presence of resident; when observing, performer may explain own presence.

6. Performer informally notes the extent of learning or proficiency of resident throughout the training:

a. May decide to discuss performance with resident at any time.

b. Does not keep formal records on what was taught, or on resident's progress.

c. May make personal notes for use in later evaluation meetings.

TASK DESCRIPTION SHEET

Task Code No. 406

This is page 1 of 2 for this task.

1. What is the output of this task? (Be sure this is broad enough to be repeatable.)

Radiology resident shown and explained mammography procedures; resident evaluated for readiness to do activities under supervision; resident observed and criticized; resident evaluated for readiness to do tasks without direct supervision; resident's work spot checked; questions answered; opinions on work given as requested; evaluation noted informally.

2. What is used in performing this task? (Note if only certain items must be used. If there is choice, include everything or the kinds of things chosen among.)

X-ray requisition forms; materials and equipment needed for procedures in mammography; related radiographs and xeromammograms; view boxes

3. Is there a recipient, respondent or co-worker involved in the task? Yes...(X) No...( )

4. If "Yes" to q. 3: Name the kind of recipient, respondent or co-worker involved, with descriptions to indicate the relevant conditions; include the kind with whom the performer is not allowed to deal if relevant to knowledge requirements or legal restrictions.

Radiology resident to be instructed in mammography procedures; any patient involved; supervisor of resident

5. Name the task so that the answers to questions 1-4 are reflected. Underline essential words.

Providing clinical training for radiology residents in mammography procedures by demonstrating procedures, explaining what is being done, answering questions; deciding when residents can perform tasks under direct supervision; observing and correcting; deciding when tasks can be done without direct supervision; spot checking and correcting; advising as requested or as deemed necessary.

List Elements Fully

Performer provides clinical training to residents in radiology in the area of mammographic examination covering mammography, examination, interpretation and possible recommendations and treatments.

1. Performer provides demonstration, explanation, informal evaluation and supervision in: reading requests for mammography and deciding what to look for; the appropriate techniques including breast examination, the radiographic equipment and techniques available; positions and angles; technical and medical interpretation of films; types of conclusions, alternative studies and tests; and courses of treatment to recommend.

2. When performer is assigned a resident, may select times, patients, and procedures to demonstrate, and may explain to resident while performer carries out own tasks:

   a. Performer explains what will be taught.
   b. Performer may narrate the steps, may explain what is being done, or may explain the basis for decisions and actions.
   c. Performer may decide to solicit questions to find out what the resident understands, may answer questions, or may elaborate on the explanation of what

OK - RP; RR; RR

6. Check here if this is a master sheet..(X)

TASK DESCRIPTION SHEET (continued)

Task Code No. 406

This is page 2 of 2 for this task.

List Elements Fully

is being done, concentrating on the relevant skills and knowledges.

  d. Performer decides when the resident has observed sufficiently and has a clear enough understanding of a procedure to carry it out under close, direct supervision and/or to assist.

3. Performer supervises and observes resident carrying out activities assigned.

  a. Performer asks the resident to do all or part of a procedure and remains at the side of the patient or carries out own portion and watches the resident perform the assigned activity.
  b. While observing, performer decides whether the activity is being done properly, whether there is a specific problem, whether there is need to demonstrate the procedure again or explain, and does so.
  c. Performer may comment on the performance, encourage or correct as deemed necessary, or do this later.
  d. Performer may decide to intervene and take over the procedure, explaining to the resident what was done incorrectly at that point or later.
  e. If decision is to demonstrate again, performer may redo and have the resident observe, or have resident repeat the procedure until it is done properly.
  f. Performer decides which procedures or activities can be done by the resident without direct supervision (although radiologist remains responsible). Informs proper supervisors; notes for own use, and/or tells this to resident.

4. Performer spot checks resident carrying out activities without direct supervision or responds to requests

List Elements Fully

for guidance, assistance or further instruction.

Performer proceeds as in steps 2 or 3 as appropriate, observing, noting areas needing improvement, determining nature of problem, assisting, giving opinions, answering questions, and providing further instruction on how to deal with unusual circumstances. Reinforces correct work. Suggests areas for improvement.

5. When patients are present for demonstrations, performer may explain presence of resident; when observing, performer may explain own presence.

6. Performer informally notes the extent of learning or proficiency of resident throughout the training:

  a. May decide to discuss performance with resident at any time.
  b. Does not keep formal records on what was taught, or on resident's progress.
  c. May make personal notes for use in later evaluation meetings.

TASK DESCRIPTION SHEET

Task Code No. 407

This is page 1 of 2 for this task.

1. What is the output of this task? (Be sure this is broad enough to be repeatable.)

Outline and content planned and prepared for lecture to residents or case conference on neuroradiology; lecture given; conference conducted by use of questions and answers.

2. What is used in performing this task? (Note if only certain items must be used. If there is choice, include everything or the kinds of things chosen among.)

Paper, pen; instructional and reading material in neuroradiology; radiographic materials; projector and slides; cine and projector and/or videotapes and player; screen; view boxes

3. Is there a recipient, respondent or co-worker involved in the task? Yes...(X) No...( )

4. If "Yes" to q. 3: Name the kind of recipient, respondent or co-worker involved, with descriptions to indicate the relevant condition; include the kind with whom the performer is not allowed to deal if relevant to knowledge requirements or legal restrictions.

Residents in radiology; program director; co-worker; library and/or clerical personnel

5. Name the task so that the answers to questions 1-4 are reflected. Underline essential words.

Planning and presenting lectures or case conferences on neuroradiology for radiology residents by deciding on content, method of presentation; preparing material; presenting lecture, being aware of responses and adjusting presentation to students' needs; using radiographic material in question and answer format to demonstrate aspects of topics for instructional purposes.

List Elements Fully

Performer presents lecture(s) or holds case conferences on neuroradiology for classes of radiology residents.

1. Performer is notified of assignment or decides what should be covered and at what depth and degree of detail, considering the residents' current academic level and objectives of the residency program.

2. Decides on method of presentation and plans lecture and/or case conference:

   a. Prepares outline.
   b. May obtain special instructional materials or asks co-worker to obtain for review. May use materials already prepared.
   c. May do research in topic area for use in lecture.
   d. May prepare slides from own source of radiographs (teaching cases) or may obtain existing radiographic material and slides from library. May ask co-worker to obtain for review, or personally chooses radiographs or computerized transverse axial scans to illustrate problem cases for a question and answer session. Performer may choose materials to contrast normal and pathological states.
   e. Decides on time to allocate for questions and answers for lecture, or may

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6. Check here if this is a master sheet..(X)

TASK DESCRIPTION SHEET (continued)

Task Code No. 407

This is page 2 of 2 for this task.

List Elements Fully	List Elements Fully
choose residents to present case material for case study conference. If so, discusses as needed.	
3. At a case conference, places radiographs, spot films or other radiographic materials on view box or uses slides and projector. May use cine and projector and/or videotape and tape player. May present computerized transverse axial scans in the form of Polaroid pictures and/or computer printouts. May have resident(s) present material. Has residents give interpretations of materials.	
Throws out questions about materials; evaluates and responds to answers, or answers questions and participates in discussion about cases involved.	
Chooses how to present answers and comments so that residents will understand how answers were arrived at.	
4. At a lecture, presents material as deemed appropriate. May note whether information is being understood, and adjust presentation accordingly.	
5. Performer may recommend reading to students.	
6. May make personal notes on residents for use in evaluation meeting.	
7. Performer may keep material and notes prepared for future use; has materials taken from library and equipment returned.	
Note: Does not submit outline or materials for review or formally test as presently practiced.	

TASK DESCRIPTION SHEET

Task Code No. 408

This is page 1 of 2 for this task.

1. What is the output of this task? (Be sure this is broad enough to be repeatable.)

Presentation prepared and made on neuroradiology developments or case studies; presentations of surgeons, neurologists or radiologists listened to; discussions participated in.

2. What is used in performing this task? (Note if only certain items must be used. If there is choice, include everything or the kinds of things chosen among.)

Radiographic and medical equipment; radiographic materials; case histories; view boxes, slide projectors

3. Is there a recipient, respondent or co-worker involved in the task? Yes...(X) No...( )

4. If "Yes" to q. 3: Name the kind of recipient, respondent or co-worker involved, with descriptions to indicate the relevant condition; include the kind with whom the performer is not allowed to deal if relevant to knowledge requirements or legal restrictions.

Surgeons; neurologists; radiologists

5. Name the task so that the answers to questions 1-4 are reflected. Underline essential words.

Participating in meetings of radiologists, surgeons and neurologists to discuss new developments, cases of interest and case problems in the fields of neurology, surgery and neuroradiology by planning and presenting new developments in the radiologic field, interesting case studies, or problems in current cases, and/or by deciding to listen to presentations about new developments in surgery, interesting case studies or case problems, and participating in discussions.

List Elements Fully

Performer attends meetings of medical staff and co-workers in surgery and neurology to discuss areas of mutual concern.

1. Performer may prepare presentations describing new work in the field of general radiology or neuroradiology:
   - a. Performer decides what to present and in what degree of depth and detail.
   - b. Decides on how to make presentation and what to use.
   - c. May prepare outline, obtain special instructional materials, do research on topic for use in presentation. May have resident assist.
   - d. May prepare slides from own source of radiographs or may obtain existing radiographic material and slides from library. May have subordinate assist.
   - e. At meeting, when performer is called upon, places radiographs, spot films or other radiographic materials on view boxes, uses slide projector and/or displays computerized transverse axial scans in the form of Polaroid pictures or computer printouts. Describes work selected. Answers questions; participates in discussion. May recommend further reading.
   - f. Performer, may, when appropriate, demonstrate or

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6. Check here if this is a master sheet..(X)

TASK DESCRIPTION SHEET (continued)

Task Code No. 408

This is page 2 of 2 for this task.

List Elements Fully

simulate new and/or relevant techniques, equipment or procedures.

- g. Performer replaces materials and equipment or has this done.

2. Performer may attend conference at which surgeons and/or neurologists present case studies and raise the problems involved, or performer may choose a case which is of educational interest from the library or from performer's personal files.

   - a. Performer may be told beforehand by department head or conference leader what current or past cases will be presented for discussion, or performer will discuss the type of information to be covered in order to select a relevant case.
   - b. Performer obtains the radiographic materials related to the cases selected or selects appropriate case. May have assistant gather materials and reviews to be sure they are appropriate.
   - c. Performer reviews the radiographs, any computerized transverse axial scans and the requisition sheets involved, and any other relevant medical information such as reports and interpretations already made.
   - d. Performer may make notes to use as reference, pointing out fine points with regard to interpretation of the radiographs or scans in connection with pathological symptoms and conditions.
   - e. At the conference, performer presents the radiographs and/or scans involved as appropriate and presents interpretation; makes relevant points so as to instruct the audience in the reasoning involved. Participates in the discussion, answers questions. May suggest reference articles on subject.

List Elements Fully

   - f. Performer replaces radiographic materials or has these replaced.
   - g. If current case studies are involved, performer may maintain files on the case(s) and read reports including final diagnosis and treatment prescriptions.

3. Performer may decide to attend presentation by surgeons, neurologists or co-workers. May make notes, ask questions and/or participate in discussion.

4. Performer may decide to attend presentation about a particular case that is of interest. May make notes, ask questions and/or participate in discussion.

5. Performer may decide to present relevant problems that performer is personally having trouble with and ask for comments and suggestions from participants.

   - a. Selects the case material needed to present the problem.
   - b. Makes presentation and poses problems involved.
   - c. Listens and participates in resulting discussions.

TASK DESCRIPTION SHEET

Task Code No. 409

This is page 1 of 3 for this task.

1. What is the output of this task? (Be sure this is broad enough to be repeatable.)

Decision made on ordering and/or deciding on type of pulmonary, bronchial, tracheal and/or laryngeal radiographic examination to order; recommendations made on technique, contrast medium, anesthetic, preparatory patient procedures as appropriate; record entered and placed for scheduling.

2. What is used in performing this task? (Note if only certain items must be used. If there is choice, include everything or the kinds of things chosen among.)

X-ray requisition form and patient's chart; relevant radiographic materials; telephone; view boxes

3. Is there a recipient, respondent or co-worker involved in the task? Yes...(x) No...( )

4. If "Yes" to q. 3: Name the kind of recipient, respondent or co-worker involved, with descriptions to indicate the relevant condition; include the kind with whom the performer is not allowed to deal if relevant to knowledge requirements or legal restrictions.

Physician requesting radiographic respiratory examination; clinician; specialist; anesthesiologist; secretary or clerk

5. Name the task so that the answers to questions 1-4 are reflected. Underline essential words.

Deciding on type of respiratory radiographic examination(s) to order for any patient in consultation with referring physician and/or specialists, by reviewing case history and relevant materials, discussing, and deciding what procedure(s), if any, to order; recommending appropriate techniques; deciding on anesthetic, preparatory patient procedures; recording decisions and recommendations; arranging for scheduling.

List Elements Fully

Performer decides on what radiographic examination of the respiratory system (involving the larynx, trachea, bronchi, or lungs) to order for a patient upon receipt of a request from a referring physician on an x-ray requisition form, by phone, or in person. Studies ordered can include any procedure for radiographic study of the respiratory system including biopsy and tomography.

1. Performer reads the x-ray requisition form and the patient's history to learn the nature of the problem and the reason for the request.

   a. If the condition or the nature of the request warrants it, performer may arrange to discuss request in cooperation with patient's attending physician or appropriate specialist.
   b. Performer studies the medical history of the patient and any radiographic materials resulting from procedures already carried out, prior radiographs on file, or interpretations already prepared by other radiologists.
   c. Performer places radiographs on view boxes for study. When there are prior chest films or bronchograms performer assesses radiographs to find whether the involvement includes the right or left bronchus, whether pathological signs

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6. Check here if this is a master sheet..(v)

TASK DESCRIPTION SHEET (continued)

Task Code No. 409

This is page 2 of 3 for this task.

List Elements Fully

are diffuse or localized, and the closeness of lesions to the heart.

- d. Performer notes whether patient (if female) is pregnant and radiographic history. Notes whether patient has a communicable or infectious condition. Notes especially whether patient has active tuberculosis
- e. If the performer finds that the information provided is inadequate, performer arranges to have other materials sent or discusses needed information with relevant physician.
- f. Performer decides whether there are contraindications to the procedure(s) requested such as adverse reactions to prior studies, allergy to the contrast medium, or the degree of radiation exposure involved.
- g. Performer considers any contraindications in relation to the need for additional information and in relation to the severity of the patient's symptoms, the suddenness of the appearance of symptoms, and the extent of definition on any current radiographs. Performer considers alternative studies. May discuss with another radiologist or appropriate specialist.

2. Performer decides whether to approve request, order additional or alternative studies, reorder earlier studies, or recommend no radiography, based on the information obtained and any discussion.

3. If performer recommends against request, discusses with ordering physician and writes reasons for refusal on requisition sheet, or destroys requisition if agreed to by referring physician. If requested by physician, performer dictates a report on the decision, presenting his or her interpretation of any current radiographs, assessment of case, reason for refusal and any other relevant comments.

List Elements Fully

Returns materials on patient; and places dictated report to be picked up for typing.

4. If performer and physician agree on alternative studies, performer may consider recommendations on technique. Performer writes out requisition, specifying orders and recommendations explicitly so that staff can prepare patient or be scheduled for work. Gives information to appropriate clerical personnel for scheduling. Signs requisition sheet if appropriate.

5. If performer decides to approve the request for the study, performer decides on technique to recommend, depending on nature of study and patient's condition. Discusses with specialist if appropriate.

   - a. Performer's decisions on technique include such things as type of biopsy, entry site(s), doing bilateral or unilateral study, type of equipment, contrast medium.
   - b. Performer may recommend use of particular anesthetic; may discuss with anesthesiologist.
   - c. Performer may order prior sedation of patient and other medications, such as to dry up lung secretions; may order prior preparation such as postural drainage, no prior food or drink for a given number of hours. May order special procedures to prevent infection or contamination of patient or environment.
   - d. Performer considers the urgency of the need and, if appropriate, expedites scheduling personally by discussing with appropriate staff person.
   - e. Performer writes orders, recommendations on technique, decisions on anesthetic, and order for patient's preparation on patient's chart explicitly so that physicians, nurses,

TASK DESCRIPTION SHEET (continued)

Task Code No. 409

This is page 3 of 3 for this task.

List Elements Fully	List Elements Fully
technologists and other personnel can prepare patient or be scheduled for work. 6. Performer gives information to appropriate secretary for scheduling. Signs requisition sheet if appropriate.	

TASK DESCRIPTION SHEET

Task Code No. 410

This is page 1 of 7 for this task.

1. What is the output of this task? (Be sure this is broad enough to be repeatable.)

Decisions made on whether to do bronchoscopy, take biopsy and/or secretion samples, photographs; pt. reassured, anesthetized; bronchoscope inserted; tissue examined with bronchoscope; biopsy, secretion samples, spot films, photographs taken; decision made whether to have bronchography performed; medical impressions, after care and bronchography orders recorded; emergency signs reported to clinician.

2. What is used in performing this task? (Note if only certain items must be used. If there is choice, include everything or the kinds of things chosen among.)

X-ray requisition form;pt.'s chart,medical records, radiographs;view boxes;emergency cart,supplies;flexible bronchoscope,power-pack,camera;nasopharyngeal airway;labeled test tubes,slides,lab jars with media or preservative;shielding;lead apron;sterile gown, gloves;topical anesthetic in atomizer,syringe,container;jelly lubricant-anesthetic;emesis basin,pad; tilt table;forceps,cotton pledgets;fluoroscope,spot film device,monitor;nylon and/or metal bristle biopsy brushes with guide wires;biopsy clamp or forceps; suction machine;saline solution;syringes;order forms; pen;phone

3. Is there a recipient, respondent or co-worker involved in the task? Yes...(X) No...( )

4. If "Yes" to q. 3: Name the kind of recipient, respondent or co-worker involved, with descriptions to indicate the relevant condition; include the kind with whom the performer is not allowed to deal if relevant to knowledge requirements or legal restrictions.

Any non-pediatric patient to have bronchoscopy;referring clinician;radiologist;technologist; nurse

5. Name the task so that the answers to questions 1-4 are reflected. Underline essential words.

Conducting bronchoscopy and related biopsy and secretion sampling of any non-pediatric pt. by deciding whether to go ahead;reassuring pt.; anesthetizing pt. with topical anesthetic;inserting flexible bronchoscope using nasopharyngeal airway;giving emergency care if needed;inspecting lungs,bronchi with bronchoscope;deciding on,obtaining brush,clamp or forcep biopsy samples,secretion samples,spot flims,photographs using access opening in bronchoscope under fluoroscopy;deciding when examination is completed,whether to order bronchography;recording medical impressions,orders,follow-up care;notifying MD of emergency signs.

List Elements Fully

Performer receives the x-ray requisition form and medical information for a patient scheduled for bronchoscopy (examination of the bronchi through a bronchoscope).

1. Performer reads the patient's requisition form and relevant medical information, including any diagnostic information already collected, to become familiar with the case or to review material seen earlier. May examine prior radiographs on view boxes.

   a. Performer notes any recommendations made on technique, anesthetic, sedation, prior abstinence from food and drink, use of postural drainage, request for biopsy or other samples, procedures to deal with infectious or communicable condition.

   Notes any other relevant medical information such as allergy to iodine-based substances, history or presence of tuberculosis, diminished pulmonary functioning, asthma, pulmonary hemorrhage or other conditions which might be contraindications to the procedure. Checks whether patient (if female) may be pregnant.

   b. Performer notes whether orders for prior administration of sedation, postural drainage or medica-

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6. Check here if this is a master sheet..(X)

TASK DESCRIPTION SHEET (continued)

Task Code No. 410

This is page 2 of 7 for this task.

List Elements Fully

tion to dry up secretions, or any other special procedures have been carried out. If not, arranges to have this done. Performer notes whether patient has abstained from food and drink for appropriate period; if not, arranges to have patient rescheduled.

c. Performer checks to see that patient has signed consent for procedure. If not, informs appropriate co-worker, arranges to have this obtained, or decides to obtain consent personally.

2. Performer may order routine preliminary radiographs of patient.

3. Performer greets patient in examination room. Attempts to reassure patient. Explains what will be involved in the procedure and attempts to enlist patient's cooperation. Answers patient's questions.

   Performer questions patient about current symptoms in relation to the condition being studied. May collect additional relevant medical history or check whether female patient may be pregnant. If appropriate, performer explains procedure and obtains patient's written consent. (Does not proceed unless there is a signed consent.)

4. Performer may view preliminary radiographs on view boxes to assess the location of lesions and to note whether these appear to be diffuse or localized. May compare with earlier radiographs.

5. Performer considers whether there are contraindications to going ahead with the procedure based on clinical information. May have clinician called and discusses patient's current condition and steps to be taken.

List Elements Fully

6. If performer decides not to proceed, records reasons and any recommendations on patient's chart. Informs appropriate co-worker. If appropriate, orders rescheduling of patient or scheduling for alternative procedure.

7. If performer decides to proceed, performer makes final decisions on technique, on areas of bronchial tree to study, based on clinical history and radiographs.

   a. Performer decides whether to insert bronchoscope directly or to use a nasopharyngeal airway to facilitate entry and to serve as a guide for introducing the bronchoscope. Makes final decision on topical anesthetic to use.
   b. Performer informs appropriate coworkers of decisions and has patient, materials and equipment prepared, including containers and slides for biopsy samples. Has patient's dentures (if any) removed.
   c. If special bronchoscope equipment is stored personally by the performer, performer obtains bronchoscope power-pack and camera; if not, has equipment brought to examination room.

8. When informed that patient and equipment are ready, performer checks whether patient has been properly prepared. Checks that emergency cart and all materials needed are present, that correct drugs and sizes of items are present. Checks that patient and anyone to remain in room has been properly shielded. Has any needed changes or adjustments made.

9. Performer plugs in power-pack or has this done, and attaches to sterile fiberoptic bronchoscope; checks that

TASK DESCRIPTION SHEET (continued)

Task Code No. 410

This is page 3 of 7 for this task.

List Elements Fully

light is on. Performer dons lead apron if fluoroscopy is to be used and sterile gown and gloves.

10. Performer proceeds to anesthetize patient using topical anesthetic:

    a. Performer has patient seated on tilt table. May have patient given emesis basin and a pad.
    b. Performer selects appropriate topical anesthetic in atomizer. Instructs patient to hold tongue out of mouth, using pad, and to breathe slowly.
    c. Performer sprays the oropharynx, lower portion of nasopharynx and the region of the epiglottis with anesthetic in atomizer. Checks and continues until gag reflex is overcome. Performer cautions patient not to swallow solution; has patient expectorate into basin.
    d. Performer continues by applying forceps wrapped with cotton pledgets and dipped in anesthetic solution to each piriform recess and to epiglottis and glottis.
    e. Performer chooses a nostril (the one which is more patent) and anesthetizes it by using the atomizer.
    f. Performer lubricates airway or bronchoscope; may use jellied anesthetic. Performer inserts into anesthetized nostril until end of airway or bronchoscope is visible through the patient's open mouth.
    g. If performer has difficulty using airway, may revert to insertion of bronchoscope directly.
    h. Performer instructs patient to inhale while performer injects a small amount of anesthetic solution with syringe through the airway, or access opening of bronchoscope to anesthetize the vocal cords and the remainder of the larynx.

List Elements Fully

    i. If performer has used airway, inserts bronchoscope through the airway until it is in position.
    j. Performer asks patient to inhale slowly and deeply while performer pushes the bronchoscope into the trachea. Performer checks whether trachea has been entered by looking into the lens at the proximal end of the bronchoscope. Turns focus knob as appropriate. Performer may position fluoroscope unit over patient and activate, checking position on TV monitor.
    k. Performer proceeds to anesthetize the entire tracheobronchial tree to prevent coughing, regardless of which side is to be examined. Performer measures appropriate amount of anesthetic solution in syringe and injects through the access opening in bronchoscope.
    l. Performer instructs patient to cough in order to spray the anesthetic throughout the bronchi. Performer may have patient lie on table and tilts table into appropriate positions while more anesthetic is injected and patient is instructed to inhale. May have patient assume other positions; repeats above steps until coughing reflex is abolished.

11. Throughout procedure performer remains alert for possible severe reactions such as vascular collapse, laryngospasm or bronchospasm.

    a. Performer determines the nature and severity of the condition. Removes bronchoscope and any other instruments. Decides on whether to provide emergency care.
    b. Depending on the symptoms, performer may carry out any or all of the following emergency procedures using equipment on emergency cart:

TASK DESCRIPTION SHEET (continued)

Task Code No. 410

This is page 4 of 7 for this task.

List Elements Fully

i) May administer oxygen or air using oxygen tank and mask or ambu bag.

ii) May clear natural airway using finger or tongue blade. May decide to establish an airway by using a laryngoscope (to view larynx) and inserting an endotracheal tube.

iii) May decide on and administer IV infusion (such as barbituates).

iv) Performer may order and administer adrenalin, parenteral hydrocortisone,a vasopressor in solution or other appropriate drugs.

c. Performer decides whether the reaction is sufficiently controlled to proceed with the procedure. May consult with clinician.

d. When patient has been revived, performer records reaction and what was done on patient's chart.

e. If performer decides to terminate, notifies appropriate medical staff; orders aftercare as appropriate;has patient transported to appropriate location. Terminates procedure by notifying appropriate staff.

f. If patient has mild reaction such as coughing or spitting up, performer injects additional anesthetic as described above or has this done. Performer reassures patient and helps patient to relax and breathe easily.

12. Performer proceeds with bronchoscopic examination by moving bronchoscope into appropriate bronchus. Performer uses fluoroscopy to check that correct bronchus has been entered. Performer encourages patient to suppress coughing throughout examination.

List Elements Fully

13. Performer uses bronchoscope to examine the tissues of the bronchial tree and lung by looking into the lens at the proximal end of the bronchoscope. Performer turns focus knob as desired and moves the bronchoscope tube as appropriate to examine areas. Performer inspects tissues for signs of pathology and blockage. Reassures patient; notes patient's condition continually.

14. As patient is being examined with bronchoscope, performer decides, based on clinical information and what is being seen, whether samples are to be taken.

Performer may decide to perform brush biopsy, tissue biopsy, or to take samples of secretion for bacterial, fungal, cytological and/or histological evaluation. Performer may also decide to take photographs of tissues to be used for educational purposes.

Performer may make such decisions at any point throughout the bronchoscopic examination. Explains to patient what will be done.

If performer decides to take samples, prepares for spot filming. If fluoroscope has spot film attachment that uses cassettes, performer has cassette inserted. Chooses full, half or quarter format and sets as appropriate. (If roll film attachment,checks that attachment is loaded with film or has this done.)

15. If performer decides to perform a brush biopsy, performer has appropriate number of brushes (nylon and/or metal bristle brushes) prepared on guide wires. Has slides and test

TASK DESCRIPTION SHEET (continued)

Task Code No. 410

This is page 5 of 7 for this task.

List Elements Fully

tubes labeled and prepared with appropriate media or preservative to receive samples.

a. Performer activates fluoroscope or has this done; watches on TV monitor to help guide the bronchoscope to the appropriate segmental or subsegmental bronchus.
b. Performer inserts brush on guide wire through access opening of bronchoscope.
c. When brush is in position performer may take spot film to show location of sample for use of clinician or has this done. Activates spot film attachment and x-ray foot pedal as appropriate. If cassette attachment, may have technologist remove cassette as spot is snapped and insert additional cassette, or does so personally.
d. With brush in position performer plunges it vigorously several times into the area of abnormality and removes the brush by pulling out gently.
e. Sets the first brushes aside for bacteriologic or fungal studies in appropriate media; as desired, uses additional brushes and has slides prepared. Performer has slides fixed immediately. Teases off tissue on the brushes and has prepared and identified for laboratory inspection
f. Has spot films processed immediately
g. Performer evaluates whether sample was taken in appropriate area by examining sample and spot films after they are processed. If performer decides,as a result of viewing samples or spot films,that the samples are inadequate, performer repeats procedure until satisfied.
h. Repeats procedure for each location chosen for brush biopsy samples.

16. If performer decides to perform a tissue biopsy using clamp or forceps, performer has laboratory jars labeled and

List Elements Fully

prepared with appropriate media or preservative to receive sample(s):

a. Performer uses fluoroscopy to position bronchoscope as close as possible to the lesion under study and to advance the forceps or clamp through the access opening of the bronchoscope. Performer positions patient appropriately.
b. With jaws of forceps or clamp in open position, and depending on the nature and location of the lesion, performer may force the jaws against the obstruction and close them while maintaining pressure, or performer may have patient inhale while performer exerts counter pressure. Closes the jaws to bite off a piece of tissue. Performer takes spot films as appropriate as described above.
c. Performer draws out instrument, releases prongs or opens forceps to drop the tissue sample into laboratory jar prepared by co-worker. Has each sample identified
d. Repeats as required until satisfied with sample.

17. Performer may decide to take a sample of secretions or may collect "washings" from irrigation of area after tissue biopsy:

a. Performer may irrigate area where biopsy sample was taken or may irrigate to provide sufficient liquid for sample by injecting saline or other appropriate solution through access opening.
b. Performer has suction machine prepared to draw up secretions or washings. Attaches tubing of suction machine to access opening of bronchoscope. Has suction machine activated and indicates when to

TASK DESCRIPTION SHEET (continued)

Task Code No. 410

This is page 6 of 7 for this task.

List Elements Fully

   stop, noting collection of specimen in glass container.
- c. Performer disconnects suction tube; and has sample prepared and identified for laboratory.

18. If performer decides to make photographs of the condition being observed for educational purposes, performer attaches tubing of special bronchoscopy camera to access opening:

    - a. Performer looks through camera lens, moves to and focuses on area selected for photography.
    - b. When area is properly under view, performer presses camera button to take photograph.
    - c. Performer has record made of number of pictures taken and locations for later identification of photos.

19. Performer decides when the examination is completed based on observation of tissues and after all needed samples have been taken; considers own observation of tissue and the patient's ability to tolerate procedure.

20. Performer considers whether it would be advisable to have bronchography done (radiography of bronchi and lungs with use of contrast medium). Considers available information, the patient's current condition and radiographic history, and the urgency of the situation. May consult with clinician or radiologist. May decide to order chest radiographs.

    If performer decides to order bronchography, decides whether this should be done at once (to take advantage of the current anesthetization of the patient and the relative ease of intubation for bronchography), or should be delayed to give patient a chance to recover from the trauma to the tracheobronchial tree and have possible side effects such as swelling and increased secretions subside.

List Elements Fully

21. If performer decides to have bronchography performed at once, arranges to have materials prepared and appropriate co-workers notified, or decides to continue personally with the patient.

22. If performer decides to terminate the examination without going immediately to bronchography performer does the following:

    - a. Performer reassures patient and gently removes the bronchoscope. If airway was used performer gently removes the nasopharyngeal airway.
    - b. Performer encourages patient to cough and/or spit up into basin.
    - c. Performer instructs patient not to eat or drink for an appropriate number of hours because the anesthetized pharynx and larynx could allow material to be aspirated into the tracheobronchial tree. Performer explains what residual or side effects may be experienced and reassures patient. If patient is out-patient has orders written out and given to patient.
    - d. Ensures that proper clean-up procedures are carried out.
    - e. Has patient returned to room or has out-patient taken to recovery area for appropriate amount of time. Ensures that any out-patient will be escorted or attended to until able to return home.

23. Performer checks that all samples are properly labeled with identification information and appropriate clinical information. Signs requisition sheet for laboratory work if appropriate.

24. Performer has bronchoscope equipment disassembled and placed for sterili-

TASK DESCRIPTION SHEET (continued)

Task Code No. 410

This is page 7 of 7 for this task.

List Elements Fully	List Elements Fully
zation and storage as appropriate; may return power-pack and camera personally. 25. If performer has decided to have bronchograms or radiographs made at a later time, fills out requisition sheet with appropriate information and signs. 26. If performer has judged that any emergency signs were in evidence, or if clinician has requested it, performer notifies physician of preliminary findings by phone. May discuss. 27. Performer records impressions of procedure on patient's chart: a. Preliminary findings. b. How patient tolerated the procedure. c. Special nursing follow-up care required such as sedation. Orders no food or drink for appropriate time. May fill out drug order form and sign. d. Any tests or radiography ordered. e. May sign chart or requisition sheet.	

TASK DESCRIPTION SHEET

Task Code No. 411

This is page 1 of 6 for this task.

1. **What is the output of this task?** (Be sure this is broad enough to be repeatable.)

Decision made on whether to do bronchography; pt. reassured, anesthetized; contrast medium instilled in bronchus under fluoroscopy; spot films taken, condition observed on TV monitor; bronchograms ordered; decisions made on additional bronchography, delayed films; complete set of radiographs approved; orders on follow-up care, radiography, medical impressions recorded; MD notified of emergency signs.

2. **What is used in performing this task?** (Note if only certain items must be used. If there is choice, include everything or the kinds of things chosen among.)

X-ray requisition form;pt.'s chart,medical records, radiographs;view boxes; emergency cart and supplies; transnasotracheal(Coudé)catheter;shielding,lead apron;sterile gown and gloves;topical anesthetic solution in atomizer,syringe and container;jelly lubricant-anesthetic;emesis basin;pad;tilt table;forceps; cotton pledgets; fluoroscope unit, TV monitor, spot film device with cassettes or roll film; contrast medium(iodized oil or barium sulfate solution);syringes;guide wire;bronchoscope;order forms;pen;phone

3. Is there a recipient, respondent or co-worker involved in the task? Yes...(X) No...( )

4. **If "Yes" to q. 3:** Name the kind of recipient, respondent or co-worker involved, with descriptions to indicate the relevant condition; include the kind with whom the performer is not allowed to deal if relevant to knowledge requirements or legal restrictions.

Any non-pediatric pt.to have bronchography;referring MD;clinician;radiologist;technologist;nurse;clerk

5. **Name the task** so that the answers to questions 1-4 are reflected. Underline essential words.

Conducting bronchography of any non-pediatric patient by deciding whether to go ahead;reassuring pt.;anesthetizing pt.with topical anesthetic;inserting transnasotracheal catheter and instilling iodized oil contrast medium into bronchus under fluoroscopy;viewing on TV monitor and taking spot films;deciding whether to study other bronchus;ordering bronchograms;deciding when examination is completed by viewing bronchograms;deciding whether to order delayed films and/or bronchography of other side;recording medical impressions,orders and follow-up care;notifying MD of emergency signs.

List Elements Fully

Performer receives the x-ray requisition form and medical information for a patient scheduled for bronchography (radiographic examination of the lung and bronchi after instillation of iodized oil contrast medium in bronchus). Requisition may result from prior bronchoscopic examination, prior bronchography of side opposite from one to be currently examined. Performer may have received request or have decided to perform bronchography on patient who has just been examined with bronchoscope, with bronchoscope still in place.

1. If not already done, performer reads the patient's requisition form and relevant medical information, including any diagnostic information already collected, to become familiar with the case or to review material seen earlier. Examines prior radiographs on view boxes.

    a. Performer notes any recommendations made on site of pathology, technique, anesthetic, contrast medium, sedation, prior abstinence from food and drink, use of postural drainage. Notes any other relevant medical information such as allergy to iodine-based substances, history of presence of tuberculosis, diminished pulmonary functioning, asthma, pulmonary hemorrhage or other conditions which might be contraindications to the procedure. Checks

OK-RP;RR;RR

6. Check here if this is a master sheet..(X)

TASK DESCRIPTION SHEET (continued)

Task Code No. 411

This is page 2 of 6 for this task.

List Elements Fully

whether patient (if female) may be pregnant, whether patient has an infectious or communicable condition.

b. Performer notes whether orders for prior administration of sedation, medication or postural drainage and sanitary procedures have been carried out. If not, arranges to have these done. Performer notes whether patient has abstained from food and drink for appropriate period; if not, arranges to have patient rescheduled.

c. Performer checks to see that patient has signed consent for procedure. If not, informs appropriate co-worker, arranges to have this obtained, or decides to obtain consent personally.

2. If not already done, performer orders scout films of patient. Specifies patient position (on or off table) to correspond to position to be used for bronchograms.

3. Performer greets patient in examination room. Attempts to reassure patient. Explains what will be involved in the procedure and attempts to enlist patient's cooperation. Answers patient's questions. If patient has just undergone bronchoscopy, performer notes patient's response to sedation and to the procedure. Performer questions patient about current symptoms in relation to the condition being studied. May collect additional relevant medical history or inquire of female patient whether she suspects she is pregnant. If appropriate, performer explains procedure and obtains patient's written consent. (Does not proceed unless there is a signed consent.)

4. Performer views preliminary radiographs on view boxes to assess the location of lesions and to note whether these appear to be diffuse or concentrated. May compare with earlier radiographs and/or prior bronchograms.

List Elements Fully

Performer evaluates whether technical factors and patient position are appropriate to provide satisfactory radiographs. If not, indicates to technologist what adjustments are needed.

5. Performer considers whether there are contraindications to going ahead with the procedure based on clinical information. May have clinician called and discusses patient's current condition and steps to be taken.

6. If performer decides not to proceed, records reasons and any recommendations on patient's chart. Informs appropriate co-worker. If appropriate, orders rescheduling of patient or scheduling for alternative procedure.

7. If performer decides to proceed, performer makes final decisions on technique, on areas of bronchial tree to study, whether to do bilateral or unilateral study, based on clinical history and radiographs.

   a. Decides on contrast medium based on patient's allergies. (Uses barium sulfate solution rather than iodized oil if patient has allergy.)
   b. If iodized oil is to be used performer has co-worker heat the contrast medium to appropriate temperature.
   c. Makes final decision on topical anesthetic.
   d. Performer informs appropriate co-workers of decisions and has patient, materials and equipment prepared, including having technical factors set for fluoroscopy. Has patient's dentures (if any) removed.

8. When informed that patient and equipment are ready, performer checks whether patient has been properly prepared. (If bronchoscope is in place, performer omits step 9.)

TASK DESCRIPTION SHEET (continued)

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This is page 3 of 6 for this task.

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- a. Checks that all materials needed and emergency cart are present, that correct drugs and sizes of items are present.
- b. Checks that patient and anyone remaining in room has been properly shielded.
- c. Has any needed changes or adjustments made.
- d. Performer dons lead apron and sterile gown and gloves.
- e. If fluoroscope has spot film attachment that uses cassettes, performer has cassette inserted. Chooses full, half or quarter format and sets as appropriate. (If roll film attachment, checks that attachment is loaded with film or has this done.)

9. Performer proceeds to anesthetize patient using topical anesthetic:

- a. Performer has patient seated on tilt table. May have patient given emesis basin and a pad.
- b. Performer selects appropriate topical anesthetic in atomizer. Instructs patient to hold tongue out of mouth, using pad, and to breathe slowly.
- c. Performer sprays the oropharynx, lower portion of nasopharynx and the region of the epiglottis with anesthetic in atomizer. Checks and continues until gag reflex is overcome. Performer cautions patient not to swallow solution; has patient expectorate into basin.
- d. Performer continues by applying forceps wrapped with cotton pledgets and dipped in anesthetic solution to each piriform recess and to epiglottis and glottis.
- e. Performer chooses a nostril (the one which is more patent) and anesthetizes it by using the atomizer.
- f. Performer lubricates Coudé catheter; may use jellied anesthetic. Performer inserts into anesthetized nostril until end of catheter is visible through the patient's open mouth.

List Elements Fully

- g. Performer instructs patient to inhale while performer injects a small amount of anesthetic solution with syringe through the catheter to anesthetize the vocal cords and the remainder of the larynx.
- h. Performer may facilitate passage of catheter into trachea by having patient flex trunk forward with chin raised and tongue held out of mouth to straighten and open the airway (Haight maneuver). Performer asks patient to inhale slowly and deeply while performer pushes the tube into the trachea. Performer checks whether a cough is incited as proof that trachea has been entered. May have patient phonate the sound ee. (If unable, the tube is properly in place.) Performer may position fluoroscope unit over patient and activate, checking position of tube on TV monitor. May tape catheter in place on patient's cheek.
- i. Performer proceeds to anesthetize the entire tracheobronchial tree to prevent coughing, regardless of which side is to be examined. Performer measures appropriate amount of anesthetic solution in syringe and injects through the catheter.
- j. Performer instructs patient to cough in order to spray the anesthetic throughout the bronchi. Performer may have patient lie on table; tilts table into appropriate positions while injecting more anesthetic and while performer instructs patient to inhale. May have patient assume other positions; repeats above steps until coughing reflex is abolished. Encourages patient to suppress coughing throughout examination.

TASK DESCRIPTION SHEET (continued)

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This is page 4 of 6 for this task.

List Elements Fully

10. If patient has just had a bronchoscopic examination and bronchoscope is still in place, performer reassures patient and proceeds with catheterization of patient:

    a. Inserts guide wire into access opening of bronchoscope, using fluoroscopy to check progress of guide wire to distal end of bronchoscope.
    b. With guide wire in position, performer gently removes the bronchoscope, leaving the guide wire in place. Arranges to have bronchoscope sterilized and stored.
    c. Performer inserts the transnasotracheal catheter over the guide wire and into position.
    d. Performer removes the guide wire.

11. Performer decides when to proceed with instillation of the contrast medium. Reassures patient and explains what will happen. Asks patient to suppress coughing.

    a. Performer checks that iodized oil contrast medium is at proper temperature. Has sterile syringe filled with proper amount or prepares personally.
    b. Performer has patient lie on radiographic table and positions fluoroscopic unit over area under study. May have room lights dimmed.
    c. Performer checks on TV monitor that catheter is placed so that the side with the suspected lesion is filled first. Has patient turned appropriately towards the side of the chest to be filled.
    d. Performer uses syringe with contrast medium and injects an appropriate amount through the catheter. Warns patient not to cough. Has patient inhale deeply to dilate bronchi.
    e. Performer activates fluoroscope or has this done. Observes the extent to which the segmental bronchi are filled. Observes the structure of the organs as they are filled. May have technical factors adjusted.
    f. Performer utilizes the tilt table controls or has patient rotate so that the contrast medium flows to the unfilled bronchi. May have patient inhale deeply. Performer may inject additional contrast until proper delineation appears on monitor.
    g. When all the branches on the side under study are filled, performer decides on what spot films to take and the patient positions to utilize for the spot films. Notes signs of pathology and any obstructions.

       Activates spot film attachment and x-ray foot pedal as appropriate. If cassette attachment,may have technologist remove cassette as spots are snapped and insert additional cassettes, or does so personally.

12. Throughout procedure performer remains alert for possible severe reactions such as vascular collapse, laryngospasm, bronchospasm or adverse reaction to contrast medium:

    a. Performer determines the nature and severity of the condition. Removes all instruments from patient. Orders emergency cart.
    b. Depending on the symptoms,performer may carry out any or all of the following emergency procedures using equipment on emergency cart:

       i) May administer oxygen or air using oxygen tank and mask or ambu bag.
       ii) May clear airway using finger or tongue blade. May decide to establish an airway by using a laryngoscope (to view larynx)

TASK DESCRIPTION SHEET (continued)

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List Elements Fully

and inserting an endotracheal tube.

iii) May decide on and administer IV infusion (such as barbituates).

iv) Performer may order and administer adrenalin, parenteral hydrocortisone, antihistamine, a vasopressor in solution or other appropriate drugs.

c. Performer decides whether the reaction is sufficiently controlled to proceed with the procedure. May consult with clinician.

d. When patient has been revived, performer records reaction and what was done on patient's chart.

e. If performer decides to terminate, notifies appropriate medical staff; orders aftercare as appropriate; has patient transported to appropriate location. Terminates procedure by notifying appropriate staff.

f. If patient has mild reaction such as coughing or spitting up, performer injects additional anesthetic as described above or has this done.

g. Performer reassures patient and helps patient to relax and breathe easily.

13. Performer decides when the given side has been sufficiently observed under fluoroscopy and sufficient spot films have been taken. Shuts fluoroscope.

14. Performer orders standard radiographic series with patient in erect position or specifies views with patient on table (to correspond with scout films).

15. Performer looks at the processed spot films and bronchograms on view boxes as soon as they are ready:

List Elements Fully

a. Determines whether the radiographs are technically adequate to demonstrate the area and condition under study and provide sufficient information to make possible a competent medical interpretation. Performer may ask opinion of clinician or another radiologist.

b. Performer decides whether to order additional views, a change in the technical factors or whether to instill additional contrast medium. Considers the information already available on the radiographs, the way in which the patient responded to the procedure, the patient's condition, and his or her cumulative exposure.

c. If the performer decides to instill additional contrast medium, repeats appropriate steps as described above. Indicates to technologist any orders on additional bronchograms such as change in technical factors or patient positioning.

d. Repeats review of resulting bronchograms as described above.

16. Performer decides whether the other bronchus should be studied. If so, performer decides whether the other side should be studied at once or examined at a later time. Performer considers the purpose of the study, the patient's condition and what has already been seen:

a. If performer decides to proceed with bronchography of the other side, performer returns to the patient and explains. Activates fluoroscope.

b. Performer pulls back on the catheter until it is in the trachea and then enters the other bronchus as described above.

TASK DESCRIPTION SHEET (continued)

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c. Performer repeats all the appropriate steps for evaluation of the other side as described above. When performer decides that the fluoroscopic portion of the examination is at an end, shuts fluoroscope, orders overhead radiographs and evaluates as described above.

17. Performer decides whether to order delayed films (especially if there is presence of chronic inflamation of the bronchial tree). If so decided, performer orders delayed films to be taken after a proper elapse of time, and fills out appropriate requisition and/or informs technologist.

18. When the performer decides that the examination is completed, indicates this to technologist and returns to the patient.

   a. Performer reassures patient and gently removes the catheter.
   b. Performer encourages the patient to cough and/or to spit up into a basin.
   c. Performer instructs patient not to eat or drink for an appropriate number of hours because the anesthetized pharynx and larynx could allow material to be aspirated into the tracheobronchial tree. Performer explains what residual or side effects may be experienced and reassures patient. If patient is outpatient, has orders written out and given to patient. Explains to patient if delayed films are to be made.
   d. If appropriate has decontamination and/or sanitary clean up procedures carried out.
   e. Has patient taken to appropriate waiting area if delayed films are to be taken.

List Elements Fully

   f. Has patient returned to room or has out-patient taken to recovery area for appropriate amount of time or after delayed films are taken. Ensures that any out-patient will be escorted or attended to until able to return home.

19. If performer has decided to have bronchography done of the other side at a later time,performer fills out requisition sheet with appropriate information and signs.

20. If performer has judged that any emergency signs were in evidence, or if clinician has requested it, performer notifies physician of preliminary findings by phone. May discuss.

21. Performer records impressions of procedure on patient's chart:

   a. Preliminary findings.
   b. How patient tolerated the procedure.
   c. Special nursing follow-up care required such as sedation. Orders no food or drink for appropriate time. May fill out drug order form and sign.
   d. Any delayed films or additional radiography ordered.
   e. May sign chart or requisition sheet.

TASK DESCRIPTION SHEET

Task Code No. 412

This is page 1 of 5 for this task.

1. What is the output of this task? (Be sure this is broad enough to be repeatable.)

Decision made on whether to do laryngography; patient reassured, instructed in maneuvers to make, anesthetized; contrast medium instilled in larynx under fluoroscopy; scout, diagnostic spot and cine films taken; condition observed on TV monitor; complete set of spot films approved; orders on follow-up care, medical impressions recorded; MD notified of emergency signs.

2. What is used in performing this task? (Note if only certain items must be used. If there is choice, include everything or the kinds of things chosen among.)

X-ray requisition form; pt.'s chart, medical records, radiographs; view boxes; emergency cart and supplies; shielding, lead apron; sterile gown and gloves; topical anesthetic solution in atomizer; syringe and container; jelly lubricant anesthetic; emesis basin; pad; tilt table; forceps and cotton pledgets; fluoroscope unit, TV monitor, spot film device; cineradiography camera and film; contrast medium (iodized oil or barium sulfate solution); syringes; curved cannula attachment for syringe; order forms; pen; telephone; headlight

3. Is there a recipient, respondent or co-worker involved in the task? Yes...(X) No...( )

4. If "Yes" to q. 3: Name the kind of recipient, respondent or co-worker involved, with descriptions to indicate the relevant condition; include the kind with whom the performer is not allowed to deal if relevant to knowledge requirements or legal restrictions.

Any non-pediatric patient to have laryngography; referring MD; clinician; radiologist; technologist; nurse; clerk

5. Name the task so that the answers to questions 1-4 are reflected. Underline essential words.

Conducting laryngography of any non-pediatric patient by deciding whether to go ahead; reassuring pt.; instructing pt. in maneuvers to be made in examination; taking scout spot films; anesthetizing pt. with topical anesthetic; instilling iodized oil contrast medium into larynx under fluoroscopy; having patient make test sounds, observing; taking spot films and cine while watching on fluoroscope monitor; deciding when examination is completed by viewing spot films; recording medical impressions and follow-up care; notifying MD of emergency signs.

List Elements Fully

Performer receives the x-ray requisition form and medical information for a patient scheduled for laryngography (radiographic examination of the larynx after instillation of iodized oil contrast medium).

1. Performer reads the patient's requisition form and relevant medical information, including any diagnostic information already collected, to become familiar with the case or to review material seen earlier. Examines relevant prior radiographs on view boxes, including tomograms.

   a. Performer notes any recommendations made on site of pathology, technique, anesthetic, contrast medium sedation, prior abstinence from food and drink. Notes any other relevant medical information such as allergy to iodine-based substances, history or presence of dental problems, asthma, or other conditions which might be contraindications to the procedure. Checks whether patient (if female) may be pregnant; checks whether patient has a communicable or infectious condition.

   b. Performer notes whether orders for prior administration of medication or sedation or sanitary procedures have been carried out. If not, arranges to have these done. Performer notes whether patient has

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6. Check here if this is a master sheet..(X)

TASK DESCRIPTION SHEET (continued)

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abstained from food and drink for appropriate period; if not, arranges to have proper elapse of time take place (may reschedule).

c. Performer checks to see that patient has signed consent for procedure. If not, informs appropriate co-worker, arranges to have this obtained, or decides to obtain consent personally.

2. Performer greets patient in examination room. Attempts to reassure patient. Explains what will be involved in the procedure and attempts to enlist patient's cooperation. Answers patient's questions. Performer questions patient about current symptoms in relation to the condition being studied. May collect additional relevant medical history or inquire of female patient whether she suspects she is pregnant. If appropriate, performer explains procedure and obtains patient's written consent. (Does not proceed unless there is a signed consent.)

3. Performer considers whether there are contraindications to going ahead with the procedure based on clinical information. May have clinician called and discusses patient's current condition and steps to be taken.

4. If performer decides not to proceed, records reasons and any recommendations on patient's chart. Informs appropriate co-worker. If appropriate, orders rescheduling of patient or scheduling for alternative procedure.

5. If performer decides to proceed, performer makes final decisions on technique:

a. Decides on contrast medium based on patient's allergies. (Uses barium sulfate solution rather than iodized oil if patient has allergy.)

List Elements Fully

b. If iodized oil is to be used, has co-worker heat the contrast medium to appropriate temperature.

c. Makes final decision on topical anesthetic.

d. Performer informs appropriate co-workers of decisions and has patient, materials, and equipment prepared, including having technical factors set for fluoroscopy. Has patient's dentures (if any) removed. May order cine equipment. If so, indicates settings desired for frame rate.

6. When informed that patient and equipment are ready, performer checks that patient has been properly prepared.

a. Checks that all materials needed and emergency cart are present, that correct drugs and sizes of items are present. Checks that patient and anyone remaining in room has been properly shielded.

b. Has any needed changes or adjustments made.

c. Performer dons lead apron and sterile gown and gloves.

d. If fluoroscope has spot film attachment that uses cassettes, performer has cassette inserted. Chooses full, half or quarter format and sets as appropriate. (If roll film attachment, checks that attachment is loaded with film or has this done.

7. Performer explains to patient that procedure includes a series of six standard maneuvers that the patient must make. Practices with patient until the patient properly produces the sounds required when requested: (a) quiet respiration; (b) forced expiration; (s) a phonated "e;" (3) Valsalva maneuver (exhalation against closed glottis); (f) the Muller maneuver (inspiration with closed glottis).

TASK DESCRIPTION SHEET (continued)

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List Elements Fully

List Elements Fully

Performer first demonstrates, then has patient imitate until satisfactory; then has patient sound on request.

8. Performer prepares for preliminary spot films by seating patient on radiographic table and positioning fluoroscope unit as appropriate. Activates fluoroscope and positions patient and unit to view larynx on TV monitor. Performer takes appropriate spot films by activating spot film attachment and foot pedal when desired view is obtained on monitor. If cassette attachment, may have technologist remove cassette as spots are snapped and insert additional cassettes, or does so personally. Has spot films processed immediately.

9. Performer views preliminary spot films on view boxes to assess the location of pathology and to note whether these appear to be diffuse or concentrated. May compare with earlier radiographs.

Performer evaluates whether technical factors and patient position are appropriate to provide adequate information. If not, indicates to technologist what adjustments are needed.

10. Performer proceeds to anesthetize patient using topical anesthetic:

    a. Performer has patient seated on tilt table. May have patient given emesis basin and a pad.
    b. Performer selects appropriate topical anesthetic in atomizer. Instructs patient to hold tongue out of mouth, using pad, and to breathe slowly.
    c. Performer sprays the oropharynx, lower portion of nasopharynx and the region of the epiglottis with anesthetic in atomizer. Checks and continues until gag reflex is overcome. Performer cautions patient not to swallow solution; has patient expectorate into basin.
    d. Performer continues by applying forceps wrapped with cotton pledgets and dipped in anesthetic solution to each piriform recess and to epiglottis and glottis.
    e. To anesthetize the vocal cords and remainder of the larynx, performer uses sterile syringe containing anesthetic solution. Attaches curved cannula. Injects (drips) anesthetic directly into the larynx through the mouth. May use headlight.
    f. Performer checks for complete anesthetization by having patient swallow. Asks patient if this was felt. If so, continues with additional anesthetic solution until the swallow is not felt.

11. Performer decides when to proceed with instillation of the contrast medium. Reassures patient and explains what will happen.

    a. Performer checks that iodized oil contrast medium is at proper temperature. Has sterile syringe filled with proper amount or prepares personally. Attaches sterile curved cannula or has this done.
    b. Performer injects (drips) contrast medium directly into larynx through the mouth. Views larynx on monitor under fluoroscopy until satisfied that larynx is properly coated with contrast medium. Reassures patient.

12. Throughout procedure performer remains alert for possible severe reactions such as vascular collapse, laryngospasm or adverse reaction to contrast medium:

TASK DESCRIPTION SHEET (continued)

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This is page 4 of 5 for this task.

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a. Performer determines the nature and severity of the condition. Orders emergency cart.

b. Depending on the symptoms, performer may carry out any or all of the following emergency procedures using equipment on emergency cart:

   i) May administer oxygen or air using oxygen tank and mask or ambu bag.
   ii) May clear airway using finger or tongue blade. May decide to establish an airway using a laryngoscope (to view larynx) and inserting an endotracheal tube.
   iii) May decide on and administer IV infusion (such as barbituates).
   iv) Performer may order and administer adrenalin, parenteral hydrocortisone, antihistamine, a vasopressor in solution or other appropriate drugs.

c. Performer decides whether the reaction is sufficiently controlled to proceed with the procedure. May consult with clinician.

d. When patient has been revived, performer records reaction and what was done on patient's chart.

e. If performer decides to terminate, notifies appropriate medical staff: orders aftercare as appropriate; has patient transported to appropriate location. Terminates procedure by notifying appropriate staff.

f. If patient has mild reaction, performer reassures patient and helps patient to relax and breathe easily.

13. When the performer decides that the larynx is sufficiently coated with the contrast medium, performer activates fluoroscope and undertakes spot filming of the larynx. May also activate cine camera:

List Elements Fully

a. Instructs patient to make the maneuvers as practiced earlier.

b. Performer positions fluoroscopic unit to desired view by checking on TV monitor. Observes dynamic action and notes pathological signs.

c. When proper sound is being made, performer activates spot film attachment and foot pedal to record view desired.

d. Performer takes appropriate number of spot films to cover the number of maneuvers and proper views(such as frontal and lateral). Has technologist replace cassettes for spot films as required, or does so personally.

e. When performer decides that appropriate number of spot and cine films have been taken, shuts fluoroscope and cine camera and has films processed.

14. Performer looks at the processed spot films on view boxes as soon as they are ready. May project cine on screen:

a. Determines whether the laryngograms are technically adequate to demonstrate the area and condition under study and provide sufficient information to make possible a competent medical interpretation. Performer may ask opinion of clinician or another radiologist.

b. Performer decides whether to take additional views, change the technical factors or whether to instill additional contrast medium. Considers the information already available on the spot films, the way in which the patient responded to the procedure, the patient's condition, and his or her cumulative exposure.

c. If the performer decides to instill additional contrast medium, repeats

TASK DESCRIPTION SHEET (continued)

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appropriate steps as described above. Indicates to technologist any change in technical factors needed. Repeats phonation and filming as described above.

- d. Repeats review of resulting laryngograms as described above. Informs technologist when radiographic study is completed.

15. Performer decides when the examination is completed and returns to patient:

    - a. Performer reassures patient.
    - b. Encourages the patient to cough and/or to spit up into a basin.
    - c. Performer instructs patient not to eat or drink for an appropriate number of hours because the anesthetized pharynx and larynx could allow material to be aspirated into the tracheobronchial tree. Performer explains what residual or side effects may be experienced and reassures patient. If patient is out-patient, has orders written out and given to patient. If appropriate, has decontamination and/or sanitary clean up procedures carried out.
    - d. Has patient returned to room or ensures that any out-patient will be escorted or attended to until able to return home.

16. If performer has judged that any emergency signs were in evidence, or if clinician has requested it, performer notifies physician of preliminary findings by phone. May discuss.

17. Performer records impressions of procedure on patient's chart:

    - a. Preliminary findings.
    - b. How patient tolerated the procedure.

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- c. Special nursing follow-up care required such as sedation. Orders no food or drink for appropriate time. May fill out drug order form and sign.
- d. May sign chart or requisition sheet.

TASK DESCRIPTION SHEET

Task Code No. 413

This is page 1 of 5 for this task.

1. **What is the output of this task?** (Be sure this is broad enough to be repeatable.)

Decisions made on whether to go ahead with lung needle biopsy, on type (aspiration or tissue) and on site;patient anesthetized, reassured; biopsy needle inserted and sample taken;samples prepared for lab; radiograph ordered and assessed for complications; biopsy site cleansed and dressed; medical impressions and orders for delayed films and after care recorded; emergency signs reported to MD.

2. **What is used in performing this task?** (Note if only certain items must be used. If there is choice, include everything or the kinds of things chosen among.)

X-ray requisition form;pt.'s chart,medical records, radiographs;emergency cart and supplies; labeled slides and lab jars with preservative;fixative;shielding;protective lead garments;sterile gown,towels, gloves;local anesthetic;antiseptic solution;swabs; biopsy needle and syringes or biopsy cutting needle; tweezers;sponge stick or towel clip;tilt table;fluoroscope unit,TV monitor,spot film attachment;order forms;pen;telephone

3. Is there a recipient, respondent or co-worker involved in the task? Yes...(x) No...( )

4. **If "Yes" to q. 3:** Name the kind of recipient, respondent or co-worker involved, with descriptions to indicate the relevant condition; include the kind with whom the performer is not allowed to deal if relevant to knowledge requirements or legal restrictions.

Any non-pediatric patient to have lung needle biopsy; referring clinician;radiologist;radiologic technologist;nurse;clerk

5. **Name the task** so that the answers to questions 1-4 are reflected. Underline essential words.

Conducting aspiration or tissue needle biopsy of the lung of any non-pediatric patient by deciding whether to go ahead;reassuring patient;selecting site;deciding on technique;injecting local anesthetic;inserting biopsy needle under fluoroscopy;aspirating or cutting tissue sample as decided;having sample(s) prepared for lab;ordering and viewing radiographs and samples; providing for care for bleeding or pneumothorax if needed;recording medical impressions,delayed films, follow-up care;notifying MD of emergency signs.

List Elements Fully

Performer receives the x-ray requisition form and medical information for a patient scheduled for lung needle biopsy (use of a needle to aspirate cells and secretions or cut a tissue sample from lesions in the lung under fluoroscopic guidance).

1. Performer reads the patient's requisition form and relevant medical information including any diagnostic information already collected to become familiar with the case or to review material seen earlier. Examines prior chest radiographs and/or tomograms on view boxes. May view prior serial radiographs of patient's lung.

   a. Performer notes any recommendations made on technique, anesthetic, sedation, suggested site and type of sample to be taken.

      Notes any other relevant medical information such as closeness of lesions to the heart, history of poor lung function, or other conditions which might be contraindications to the procedure. Checks whether patient (if female) may be pregnant;checks whether patient has an infectious or communicable condition.

   b. Performer notes whether any orders for prior administration of medication, sedation or other procedures

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6. Check here if this is a master sheet..(X)

TASK DESCRIPTION SHEET (continued)

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have been carried out. If not, arranges to have them done.

c. Performer checks to see that patient has signed consent for procedure. If not, informs appropriate co-worker, arranges to have this obtained, or decides to obtain consent personally.

d. If not already done, performer orders scout films of patient.

2. Performer greets patient in examination room. Attempts to reassure patient. Explains what will be involved in the procedure and attempts to enlist patient's cooperation. Answers patient's questions. Performer questions patient about current symptoms in relation to the condition being studied. May collect additional relevant medical history or inquire of female patient whether she suspects she is pregnant. If appropriate, performer explains procedure and obtains patient's written consent. (Does not proceed unless there is a signed consent.)

3. Performer considers whether there are contraindications to going ahead with the procedure based on clinical information. May have referring clinician called and discusses patient's current condition and steps to be taken.

If performer decides not to proceed, records reasons and any recommendations on patient's chart. Informs appropriate co-worker. If appropriate, orders rescheduling of patient or scheduling for alternative procedure.

4. If performer decides to proceed, performer makes preliminary decision on site for biopsy,and decides on technique:

a. Performer views preliminary (scout) radiographs and prior films on view

List Elements Fully

boxes to assess the location of lesions; notes whether these appear to be diffuse or localized; considers choice of site.

b. Performer evaluates whether technical factors and patient position are appropriate. If not, indicates to technologist what adjustments are needed.

c. Performer chooses whether to aspirate cell material through a syringe attached to a needle (primarily for localized lesions) or to take a tissue specimen using a cutting needle which has an outer cannula, a device to close and cut off a tissue specimen and is equipped to retain the tissue when the needle and cannula are withdrawn (primarily for diffuse lesions). Performer decides on needle size and type.

d. Performer chooses the preliminary site based on the type of lesion; for diffuse pathology selects area free of major blood vessels, bronchi and away from heart.

e. Performer decides on or notes whether specimen is to be prepared for cytology and/or histology lab examination. Decides on local anesthetic.

f. Performer informs appropriate coworkers of decisions and has patient, materials and equipment prepared, including containers and slides for biopsy sample(s) and technical factors for fluoroscopy.

5. When informed that patient and equipment are ready, performer checks whether patient has been properly prepared:

a. Checks that all materials needed are present, that correct drugs and sizes of items and emergency cart are present.

TASK DESCRIPTION SHEET (continued)

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This is page 3 of 5 for this task.

List Elements Fully

b. Checks that patient has been properly positioned and shielded.
c. Has any needed changes or adjustments made. Checks staff shielding.
d. Performer dons lead apron and sterile gown and gloves.
e. If not already done, performer has needles and syringes needed in procedure prepared; may assemble the needle for the biopsy personally. Has slides and containers labeled and prepared to receive samples.
f. If performer plans to do spot filming, has cassette inserted. Chooses full, half or quarter format and sets as appropriate. (If roll film attachment, checks that attachment is loaded with film or has this done.)

6. Performer may use fluoroscopy to make final decision on site:

   a. Positions fluoroscope unit over patient; may have lights in room dimmed. Activates fluoroscope. Adjusts unit, table, or patient's position until the lesion or mass to be entered is visible on the TV monitor. May indicate needed adjustment in technical factors to technologist.
   b. Performer searches for a point on the thorax where the lesion is nearest to the thoracic wall, not concealed by the scapula or ribs, or overlain by the heart or large vessels. Performer may mark the point of entry. Shuts fluoroscope.

7. Performer proceeds to anesthetize patient's chest wall down to the parietal pleura with a local anesthetic at the puncture site:

   a. Reassures patient and does so as deemed needed throughout procedure. Explains that performer will ask the patient to hold breath from time to time during procedure.

List Elements Fully

   b. Cleanses site for injection of anesthetic by swabbing with prepared antiseptic solution. Covers surrounding areas with sterile towels, leaving only small area for injection and puncture uncovered.
   c. Checks amount of local anesthetic to be injected as shown by nurse; draws anesthetic into sterile syringe. Expels air; inserts needle, and injects anesthetic in site selected.
   d. Removes needle; waits for area to become anesthetized.

8. Performer proceeds to position needle for biopsy under fluoroscopic guidance:

   a. Performer positions fluoroscope unit over site as described above. Activates fluoroscope.
   b. When the technical quality of the TV image is judged adequate, performer uses a sponge stick or towel clip to clasp the selected biopsy needle and permit viewing of needle on monitor without exposing performer's hands to direct radiation.
   c. Performer positions the needle for entry by viewing on TV monitor:

      1) With a localized lesion performer places needle at selected site over the lesion or lateral to it so that it will enter the selected portion of the mass. Performer inserts needle into site, negotiating the [illegible]ing space and feeling for a [illegible], palpable sensation which in[illegible] that tumor tissue has bee[illegible]rated. If performer does not f[illegible] palpable sensation, performer may redo needle placement, checking on TV monitor; withdraws and reinserts as deemed necessary until gritty sensation is felt.

TASK DESCRIPTION SHEET (continued)

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This is page 4 of 5 for this task.

List Elements Fully

List Elements Fully

ii) With a diffuse lesion performer places needle at selected site and inserts needle, avoiding large vessels or bronchi. Checks location of needle on TVmonitor.

d. When the lesion has been entered, performer advances needle into the lesion as judged appropriate; may correct the direction of the needle.
e. When needle is in position performer may take spot film to show location of sample for use of clinician. Activates spot film attachment and x-ray foot pedal as appropriate.
f. When the desired portion of the lesion has been reached, performer shuts fluoroscope.

9. If needle aspiration biopsy is being performed, performer obtains cell samples as follows:

a. May rotate needle clockwise and counterclockwise to loosen small tissue fragments near the opening of the needle.
b. Performer has patient hold breath while performer removes the stylet (may attach a tube extension) and applies a sterile empty syringe to the needle or extension. Indicates that patient can breathe again.
c. Performer attempts to draw sample with suction by pulling back on syringe. Checks that blood and bits of tumor have been aspirated into syringe.
d. If no bloody tissue is obtained or not enough is obtained performer may decide to repeat procedure as appropriate until satisfied with the sample and quantity taken.
e. Performer gently withdraws the syringe and needle while fixating the plunger of the syringe.
f. Performer blows out the aspirated material on a prepared slide. Performer may pick out attendant tissue fragments with sterile needle or tweezers and have these fixed. Performer has the rest of the material smeared on slides and fixed quickly for cytological analysis. Makes sure location of lesion is recorded.

10. If tissue biopsy is being performed, performer obtains tissue samples as follows:

a. Performer has patient hold still while the performer pushes down on the mechanism which activates the cutting action of the needle, obtaining a sample of tissue (which is retained in the instrument until withdrawn).
b. Performer gently withdraws the needle and cannula.
c. When the needle has been withdrawn performer drops the tissue sample into the laboratory jar prepared by co-worker. Performer has record made of location from which sample is taken and has sample prepared for histologic laboratory examination.

11. Throughout procedure performer remains alert for possible severe reactions to the procedure due to severe bleeding, respiratory distress or major pneumothoracic collapse.

Performer determines the nature and severity of the condition. Orders emergency cart. If appropriate arranges for emergency care for severe bleeding, suction for major pneumothorax. May administer oxygen or air using oxygen tank and mask or ambu bag.

12. Performer decides when the biopsy procedure is completed based on fluoroscopy and observation of the samples.

TASK DESCRIPTION SHEET (continued)

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This is page 5 of 5 for this task.

List Elements Fully

Performer reassures patient. Swabs site(s) of injection(s) with antiseptic solution and orders sterile dressing or applies personally.

13. Performer orders overhead radiographs to check for complications. Indicates what is needed to radiologic technologist. May fill out requisition form and sign.
    a. Performer looks at the processed chest radiographs on view boxes as soon as they are ready and compares with scout films.
    b. Performer determines whether the radiographs are technically adequate to demonstrate the area and condition under study and provide sufficient information to make possible a competent medical interpretation. Checks for the evidence left by needle (tracks). Performer may ask opinion of clinician or another radiologist.
    c. Performer checks whether there is evidence of air in the pleural cavity (pneumothorax) and the amount (size). Checks whether there is evidence of bleeding.
    d. Performer may decide to have additional views taken. Indicates what is needed to technologist and reviews additional radiographs as above. Indicates when the radiographic examination is completed.

14. Performer orders delayed films as appropriate.

15. Performer arranges for after care for the patient depending on assessment of patient's condition:
    a. If there is evidence of bleeding or pneumothorax, performer arranges for observation and use of delayed films to check whether these clear up spontaneously or, if severe, performer arranges for treatment.
    b. If there is any suspicion of an infectious or communicable condition performer makes sure that all instruments are appropriately handled and sanitized.
    c. Performer checks that all samples are properly labeled with identification information and appropriate clinical information. Signs requisition sheet for laboratory work if appropriate.
    d. Has patient returned to room if appropriate.

16. If performer has judged that any emergency signs were in evidence, or if clinician has requested it, performer notifies physician of preliminary findings by phone. May discuss.

17. Performer records impressions of procedure on patient's chart:
    a. Preliminary findings.
    b. How patient tolerated the procedure; any evidence of bleeding and/or pneumothorax.
    c. Special follow-up care required including sedation. May fill out drug order form and sign.
    d. Any emergency care prescribed.
    e. Delayed films ordered.
    f. May sign chart or requisition sheet.

TASK DESCRIPTION SHEET

Task Code No. 414

This is page 1 of 2 for this task.

1. **What is the output of this task?** (Be sure this is broad enough to be repeatable.)

Radiographic respiratory material read, interpreted; conclusions drawn and recommendations made orally or dictated; physician called about emergency signs; selected radiographs earmarked for study or library use; material rejacketed, report placed for typing.

2. **What is used in performing this task?** (Note if only certain items must be used. If there is choice, include everything or the kinds of things chosen among.)

X-ray requisition forms; current radiographs, view boxes, prior radiographic materials;cine projector and screen; telephone, dictation equipment; pen; magnifying glass

3. Is there a recipient, respondent or co-worker involved in the task? Yes...(X) No...( )

4. **If "Yes" to q. 3:** Name the kind of recipient, respondent or co-worker involved, with descriptions to indicate the relevant condition; include the kind with whom the performer is not allowed to deal if relevant to knowledge requirements or legal restrictions.

Co-workers; clinician; referring physician

5. **Name the task** so that the answers to questions 1-4 are reflected. Underline essential words.

Reading, interpreting and making recommendations on radiographic materials involving bronchi, lungs, trachea and/or larynx, or giving opinions to co-workers by reviewing medical information and requisition sheet(s); evaluating new and old films; notifying ordering physician of emergency signs; explaining opinions or dictating findings and recommendations; placing report for typing.

List Elements Fully

Performer reads and interprets completed radiographs of lungs, trachea, bronchi and/or larynx, or provides opinions to co-workers or respiratory clinicians when requested on interpretation and conclusions regarding radiographic materials dealing with the procedures they are doing involving the respiratory system.

1. If responding to request, performer goes to where radiographic material is on view. Listens while co-worker explains problem on how to proceed next or problem of interpretation.

   If reading and interpreting own completed work, performer obtains the jacketed radiographic work-ups. Includes the current set of radiographs,cine film,tomograms, their requisition sheets,and prior films if available. Goes to reading area.

2. Asks about, reads, or reviews x-ray requisition forms and materials on patient's medical history (reason for request, decisions made on technique, comments from referring physician, or consulting physician's notes made during the procedure, and interpretations made of procedures already completed).

   If reading and interpreting own work, places relevant ra-

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6. Check here if this is a master sheet..(X)

TASK DESCRIPTION SHEET (continued)

Task Code No. 414

This is page 2 of 2 for this task.

List Elements Fully

diographs on view box, including prior films. Projects cine film on screen. If responding to request, may ask to see earlier films.

3. Performer reads and interprets the radiographic materials:

   a. Decides whether any abnormalities, changes, or suspicious signs warrant the immediate attention of the patient's physician. If so, telephones physician at once and discusses findings (or recommends that co-worker in charge of case do this).
   b. For own work, decides what to report and what recommendations to make.
   c. In response to request, decides what to recommend to co-worker. Explains interpretation and recommendations verbally, indicating how conclusions were arrived at, including medical and technical considerations.

4. Performer dictates findings (for own work) by explaining what appears on the films. Describes worrisome or suspicious signs, obvious abnormalities and/or changes over time, referring to earlier films. (Might indicate presence of artifacts which do not have medical significance).

   Indicates what implications can be drawn from findings and what conclusions and/or courses of action are warranted, including need for additional studies, tests, or courses of treatment.

   Dictates report in the style: There is ....on.... It has the characteristics of.... I believe that this indicates... This could mean that.... It is necessary to determine whether.... This can be done by....

List Elements Fully

5. May decide whether any of the material is unusual or of special interest and warrants inclusion in museum library, or should be used for study purposes. Marks jackets appropriately if so decided.

6. Returns own patient's radiographic material, requisition sheet and tape of dictation to proper jacket, and places to be picked up for typing.

TASK DESCRIPTION SHEET

Task Code No. 415

This is page 1 of 2 for this task.

1. What is the output of this task? (Be sure this is broad enough to be repeatable.)

Outline and content planned and prepared for lecture to residents or case conference on bronchi, lungs, trachea or larynx; lecture given; conference conducted by use of questions and answers.

2. What is used in performing this task? (Note if only certain items must be used. If there is choice, include everything or the kinds of things chosen among.)

Paper, pen; instructional and reading material on respiratory radiology; radiographic materials; projector and slides; cine and projector and/or videotapes and player; screen; view boxes

3. Is there a recipient, respondent or co-worker involved in the task? Yes...(X) No...( )

4. If "Yes" to q. 3: Name the kind of recipient, respondent or co-worker involved, with descriptions to indicate the relevant condition; include the kind with whom the performer is not allowed to deal if relevant to knowledge requirements or legal restrictions.

Residents in radiology; program director; co-worker; library and/or clerical personnel

5. Name the task so that the answers to questions 1-4 are reflected. Underline essential words.

Planning and presenting lectures or case conferences on pulmonary, tracheal, bronchial and laryngeal radiology for radiology residents by deciding on content, method of presentation; preparing material; presenting lecture, being aware of responses and adjusting presentation to students' needs; using radiographic material in question and answer format to demonstrate aspects of topics for instructional purposes.

List Elements Fully

Performer presents lecture(s) or holds case conferences on the radiology of the lungs, trachea, bronchi and larynx for classes of radiology residents.

1. Performer is notified of assignment or decides what should be covered and at what depth and degree of detail, considering the residents' current academic level and objectives of the residency program.

2. Decides on method of presentation and plans lecture and/or case conference:

   a. Prepares outline.
   b. May obtain special instructional materials or asks co-worker to obtain for review. May use materials already prepared.
   c. May do research in topic area for use in lecture.
   d. May prepare slides from own source of radiographs (teaching cases) or may obtain existing radiographic material and slides from library. May ask co-worker to obtain for review, or personally choose radiographs to illustrate problem cases for a question and answer session. Performer may choose materials to contrast normal and pathological states.
   e. Decides on time to allocate for questions and answers for lecture, or may

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6. Check here if this is a master sheet..(X)

TASK DESCRIPTION SHEET (continued)

Task Code No. 415

This is page 2 of 2 for this task.

List Elements Fully	List Elements Fully
choose residents to present case material for case study conference. If so, discusses as needed. 3. At a case conference, places radiographs, spot films or other radiographic materials on view boxes or uses slides and projector. May use cine and projector and/or videotape and tape player. May have resident(s) present material. Has residents give interpretations of materials. Throws out questions about materials; evaluates and responds to answers, or answers questions and participates in discussion about cases involved. Chooses how to present answers and comments so that residents will understand how answers were arrived at. 4. At a lecture, presents material as deemed appropriate. May note whether information is being understood, and adjust presentation accordingly. 5. Performer may recommend reading to students. 6. May make personal notes on residents for use in evaluation meeting. 7. Performer may keep material and notes prepared for future use; has materials taken from library and equipment returned. Note: Does not submit outline or materials for review. Does not formally test.	

TASK DESCRIPTION SHEET

Task Code No. 416

This is page 1 of 2 for this task.

1. What is the output of this task? (Be sure this is broad enough to be repeatable.)

Radiology resident shown and explained respiratory radiography procedures; resident evaluated for readiness to do activities under supervision; resident observed and criticized; resident evaluated for readiness to do tasks without direct supervision; resident's work spot checked and criticized; questions answered; opinions on work given as requested; evaluation noted informally.

2. What is used in performing this task? (Note if only certain items must be used. If there is choice, include everything or the kinds of things chosen among.)

X-ray requisition forms; materials and equipment needed for procedures in respiratory radiography; related radiographs; emergency equipment; view boxes

3. Is there a recipient, respondent or co-worker involved in the task? Yes...(X) No...( )

4. If "Yes" to q. 3: Name the kind of recipient, respondent or co-worker involved, with descriptions to indicate the relevant condition; include the kind with whom the performer is not allowed to deal if relevant to knowledge requirements or legal restrictions.

Radiology resident to be instructed in pulmonary,tracheal,bronchial and laryngeal radiographic procedures;any patient involved;clinicians;supervisor of resident

5. Name the task so that the answers to questions 1-4 are reflected. Underline essential words.

Providing clinical training for radiology residents in radiographic procedures of lungs,bronchi,trachea and/or larynx by demonstrating procedures, explain- what is being done, answering questions; deciding when residents can perform tasks under direct supervision; observing and correcting; deciding when tasks can be done without direct supervision; spot checking and correcting; advising as requested or as deemed necessary.

List Elements Fully

Performer provides clinical training to residents in radiology in the area of pulmonary, bronchial,tracheal and laryngeal radiography covering choice of examinations such as contrast studies, tomography,broncoscopy, biopsy, medical aspects of procedures, interpretation of radiographic material, and possible recommendations and treatments.

1. Performer provides demonstration, explanation, informal evaluation and supervision in: reading requests for radiographic procedures and deciding on best procedure;what to look for;available medical and technical procedures including types of examinations, anesthetics, surgical entry, use of contrast media,technical equipment,positions and angles, contraindications; providing technical and medical interpretation of radiographic materials; learning range of medical conclusions that can be drawn,additional tests, and courses of treatment to consider.
2. When performer is assigned a resident, may select times, patients, and procedures to demonstrate, and may explain to resident while performer carries out own tasks:
   a. Performer explains what will be taught.
   b. Performer may narrate the steps, may explain what is

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6. Check here if this is a master sheet..(X)

TASK DESCRIPTION SHEET (continued)

Task Code No. 416

This is page 2 of 2 for this task.

List Elements Fully

being done, or may explain the basis for decisions and actions.

c. Performer may decide to solicit questions to find out what the resident understands, may answer questions, or may elaborate on the explanation of what is being done, concentrating on the relevant skills and knowledges.
d. Performer decides when the resident has observed sufficiently and has a clear enough understanding of a procedure to carry it out under close, direct supervision and/or to assist.

3. Performer supervises and observes resident carrying out activities assigned.

   a. Performer asks the resident to do all or part of a procedure and remains at the side of the patient or carries out own portion and watches the resident perform the assigned activity.
   b. While observing, performer decides whether the activity is being done properly, whether there is a specific problem, whether there is need to demonstrate the procedure again or explain, and does so.
   c. Performer may comment on the performance, encourage or correct as deemed necessary, or do this later.
   d. Performer may decide to intervene and take over the procedure, explaining to the resident what was done incorrectly at that point or later.
   e. If decision is to demonstrate again, performer may redo and have the resident observe, or have resident repeat the procedure until it is done properly.
   f. Performer decides which procedures or activities can be done by the resident without direct supervision (although radiologist remains responsible). Informs proper supervisors, notes for own use, and/or tells this to resident.

List Elements Fully

4. Performer spot checks resident carrying out activities without direct supervision or responds to requests for guidance, assistance or further instruction.

   Performer proceeds as in steps 2 or 3 as appropriate, observing, noting areas needing improvement, determining nature of problem, assisting, giving opinions, answering questions, and providing further instruction on how to deal with unusual circumstances. Reinforces correct work. Suggests areas for improvement.

5. When patients are present for demonstrations, performer may explain presence of resident; when observing, performer may explain own presence.

6. Performer informally notes the extent of learning or proficiency of resident throughout the training:

   a. May decide to discuss performance with resident at any time.
   b. Does not keep formal records on what was taught, or on resident's progress.
   c. May make personal notes for use in later evaluation meetings.

TASK DESCRIPTION SHEET

Task Code No. 417

This is page 1 of 2 for this task.

1. What is the output of this task? (Be sure this is broad enough to be repeatable.)

Outline and content prepared for lecture to medical students on radiography of lungs, trachea, bronchi, or larynx; instructional materials collected, researched or prepared; lecture given.

2. What is used in performing this task? (Note if only certain items must be used. If there is choice, include everything or the kinds of things chosen among.)

Paper, pen; instructional and reading material in respiratory radiography; slides of radiographic materials; projector

3. Is there a recipient, respondent or co-worker involved in the task? Yes...(X) No...( )

4. If "Yes" to q. 3: Name the kind of recipient, respondent or co-worker involved, with descriptions to indicate the relevant condition; include the kind with whom the performer is not allowed to deal if relevant to knowledge requirements or legal restrictions.

Medical students; person in charge of medical student program; resident; library and/or clerical personnel

5. Name the task so that the answers to questions 1-4 are reflected. Underline essential words.

Planning and presenting lectures on pulmonary, bronchial, tracheal and laryngeal radiography for medical students by deciding on content, method of presentation; preparing material; presenting lecture, being aware of responses, and adjusting presentation to students' needs.

List Elements Fully

Performer presents lecture(s) on assigned aspect(s) of radiography of lungs, trachea, bronchi and larynx to classes of medical students.

1. Performer is notified of assignment or decides what should be covered and at what depth and degree of detail, considering the students' current academic level and curriculum objectives of medical school. May request change of time or topic and discusses with program director.

2. Decides on method of presentation and plans lecture:

   a. Prepares outline.
   b. May obtain special instructional materials or asks co-worker to obtain and reviews. May use materials already prepared.
   c. May do research in topic area for use in lecture.
   d. May prepare slides from own source of radiographs or may obtain existing slides or films from library and log book.
   e. Performer may choose materials to contrast normal and pathological states.
   f. Decides on time to allocate for questions and answers.
   g. May have resident select materials for review.

3. Presents lecture as deemed appropriate. Attempts to note whether information is

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6. Check here if this is a master sheet..(X)

TASK DESCRIPTION SHEET (continued)

Task Code No. 417

This is page 2 of 2 for this task.

List Elements Fully	List Elements Fully
being understood and adjusts presentation accordingly. Uses instructional material, answers questions, depending on plans. Leads discussions. May recommend additional reading. 4. May make note of any outstanding students and may report this to person in charge of medical student program. May keep materials and notes prepared for future use. Note: Does not submit outline or materials for review. Does not formally test students' learning.	

TASK DESCRIPTION SHEET

Task Code No. 418

This is page 1 of 2 for this task.

1. What is the output of this task? (Be sure this is broad enough to be repeatable.)

Decision made on ordering and/or deciding on type of obstetrical radiographic procedure; recommendations made on technique, preparatory patient procedures and care as appropriate; record entered and placed for scheduling.

2. What is used in performing this task? (Note if only certain items must be used. If there is choice, include everything or the kinds of things chosen among.)

X-ray requisition form and patient's chart; relevant radiographs, scintillation scans, ultrasonograms; telephone; view boxes; pen

3. Is there a recipient, respondent or co-worker involved in the task? Yes...(X) No...( )

4. If "Yes" to q. 3: Name the kind of recipient, respondent or co-worker involved, with descriptions to indicate the relevant condition; include the kind with whom the performer is not allowed to deal if relevant to knowledge requirements or legal restrictions.

Obstetrician requesting obstetrical radiography; co-worker; secretary or clerk

5. Name the task so that the answers to questions 1-4 are reflected. Underline essential words.

Deciding on type of obstetrical radiographic procedures to order for pregnant patient in consultation with referring obstetrician by reviewing case history and relevant materials, discussing lab reports, indications; considering contraindications and need; approving, recommending alternative studies, and/or refusing approval; if approved, recommending technique, sedation, patient preparation; recording orders and recommendations; placing for scheduling and/or typing.

List Elements Fully

Performer decides on approving an examination or procedure requiring obstetrical radiography upon receipt of a request from a referring obstetrician on an x-ray requisition form, by phone or in person. Request may be for pelvimetry, for a study of the fetus, or for localization of the placenta, and may be requested in connection with the need to provide an intrauterine transfusion(IUT).The request may be for an initial study or for a repeat, such as after a prior intrauterine transfusion. Request may be for a study which does not require a special procedure but does require prior approval.

1. Performer reads the x-ray requisition form and the patient's history to learn the nature of the problem and the reason for the request.
    a. Performer studies the medical history of the patient, materials resulting from earlier studies,and related reports. Notes whether patient has infectious or communicable condition; notes the length of the patient's pregnancy. Notes any history of allergy to iodine based substances.
    b. Depending on the nature of the request, performer may study laboratory reports, scintillation scans, ultrasonograms, prior radio-

OK-RP;RR;RR

6. Check here if this is a master sheet..(x)

TASK DESCRIPTION SHEET (continued)

Task Code No. 418

This is page 2 of 2 for this task.

List Elements Fully

graphs, prior obstetrical history and other related information to consider the request in terms of the need for the study, contraindications, and alternative studies. Places radiographs on view boxes. Performer considers the cumulative radiation exposure of the mother and the fetus.

c. If the performer finds that the information provided is inadequate, performer arranges to have other materials sent or discusses with obstetrician.

d. If appropriate, performer arranges to discuss the implications of the existing medical information with the patient's attending obstetrician. Discusses contraindications and alternative procedures which would involve less or no radiation exposure. May discuss with another radiologist.

2. Performer decides whether to approve request, order additional or alternative studies, or recommend against the study, based on the information obtained and any discussion.

   a. If performer recommends against the request, discusses with referring physician if not already done and writes reasons for refusal on requisition sheet, or destroys requisition sheet if agreed to by referring physician.

   b. If performer and physician agree on alternative study, or if performer decides to approve the request for the study, performer may decide to make recommendations on technique, depending on nature of study and patient's condition. May discuss with obstetrician.

   c. Recommendations on technique include such things as preparation of patient prior to procedure, use of

List Elements Fully

sedation. For intrauterine studies performer may recommend type of study to order to locate placenta (such as scintillation scan or ultrasound), type of contrast material obstetrician should instill into the maternal amniotic fluid and amount, duration of time to allow between instillation and the radiographic procedure, type of materials to use such as transfusion needle with or without catheter. Performer may discuss with obstetrician.

   For pelvimetry, performer may recommend the timing of the pelvimetry procedure.

3. Performer writes orders as appropriate for agreed-upon procedures; writes recommendations on technique and for patient's preparation on patient's chart explicitly so that technologists and other personnel can prepare patient or be scheduled for work. For radiography not requiring special procedure performer may specify position and/or radiographic technique. Performer gives information to appropriate staff person for scheduling. Signs requisition sheet if appropriate.

TASK DESCRIPTION SHEET

Task Code No. 419

This is page 1 of 3 for this task.

1. What is the output of this task? (Be sure this is broad enough to be repeatable.)

Centimeter rulers prepared from lateral and anteroposterior pelvimetric radiographs; required diameters measured and recorded; calculations made and recorded; condition, structure, position and normality of maternal pelvic and fetal structures and compatibility noted, assessed, and findings (including feasibility of normal vaginal delivery) noted, discussed, recorded, dictated; report placed for filing or typing.

2. What is used in performing this task? (Note if only certain items must be used. If there is choice, include everything or the kinds of things chosen among.)

Patient's x-ray requisition form, medical records; processed Colcher-Sussman pelvimetric radiographs; view boxes; prepared subpubic angle chart; x-ray pelvimetry chart; pen, ruler; paper; telephone; dictation equipment; magnifying glass

3. Is there a recipient, respondent or co-worker involved in the task? Yes...(X) No...( )

4. If "Yes" to q. 3: Name the kind of recipient, respondent or co-worker involved, with descriptions to indicate the relevant condition; include [illegible] kind with whom the performer is not allowed to deal if relevant to knowledge requirements or legal restrictions.

Attending radiologist; clerical staff member; obstetrician

5. Name the task so that the answers to questions 1-4 are reflected. Underline essential words.

Calculating and interpreting radiographic pelvimetry using Colcher-Sussman technique by constructing centimeter scales from radiographs; measuring maternal pelvic and fetal-head diameters on radiographs; calculating totals and averages; noting and assessing compatability of dimensions, appearance, condition and position of pelvic and fetal structures; recording findings; assessing feasibility of normal vaginal or forceps delivery; noting presence of maternal or fetal abnormalities; discussing with obstetrician; recording findings and dictating report if appropriate; placing for filing and/or typing.

List Elements Fully

Performer receives the x-ray requisition form for pelvimetry, two processed radiographs of the maternal pelvis shortly before delivery or at onset of delivery (anteroposterior and lateral) for pelvimetry calculations as a regular assignment or in relation to a request for interpretation.

1. Performer reads x-ray requisition form and any relevant medical case history information to become familiar with the case. Notes whether the patient has already gone into labor or whether radiographs represent a pre-labor study. Discusses with obstetrician requesting the study if appropriate; requests additional information if warranted.

   a. Performer views radiographs on view boxes to check that the fetal head is in the midline of the projection for accuracy of the measurements and calculations. If fetal head is not at midline, performer considers how important it is to obtain precise measurements in relation to dangers of additional exposure to radiation. Has radiography repeated only if judged essential.

   b. Performer observes the structures of the female pelvis and the fetus on the radiographs and notes the image of the Colcher-Sussman ruler on the radio-

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6. Check here if this is a master sheet..(X)

TASK DESCRIPTION SHEET (continued)

Task Code No. 419

This is page 2 of 3 for this task.

List Elements Fully

graphs (placed and radiographed so that the ruler will have the same distortion as the diameters of interest on each projection, so that the ruler markings on each film can be used as a centimeter scale for that film).

c. May discuss with referring physician what problems are of immediate relevance to the pelvimetry.

2. Performer assembles the appropriate charts and papers used for the Colcher-Sussman method of pelvimetry or has this done.

3. Performer transfers the centimeter markings from each radiograph to a sheet of paper labeled as anteroposterior or lateral projection or on appropriately labeled edge of the preprinted x-ray pelvimetry chart. Performer does this by laying the edge of the paper against the radiographed scale, and marking the paper's edge with the scale's tick marks and values as they appear.

4. For each view the performer uses the appropriate scale just created to measure predetermined intersecting diameters at the level of the actual inlet, the midpelvis and at the level of the outlet. Performer measures the predefined diameter of the true conjugate using the lateral view. Records on chart.

   For each view the performer measures the fetal head diameters (shortest and longest). Records on chart.

5. Performer fills in on the pelvimetry chart the identification information called for and then calculates and records the following measurements:

   a. The sum of the anteroposterior and transverse diameters for each of the three levels.

List Elements Fully

   b. The average diameter of the fetal head based on the shortest and longest measurements for each view.
   c. Performer determines the subpubic angle by measuring the height of the subpubic arch on the lateral view and the base line of the subpubic arch on the AP projection and noting the angle entered on a prepared subpubic angle chart where the two measurements meet in the row and column arrangement.

6. Performer compares the pubic diameters to the normal range (preprinted on the pelvimetry chart) and compares the subpubic angle with the given average normal angle.

   Performer compares the pubic dimensions with the dimensions of the fetal head.

7. Based on the available information on the radiographs and other materials, performer notes and records the position of the fetal head and spine, its moulding, and the location of the vertex (or crown). Performer also records the separation of the maternal symphysis, position of the coccyx, and the lumbosacral articulation. Notes the shape of the inlet and/or the type of pelvis involved; records.

8. Performer now considers whether there is an absolute disproportion between the fetal head and maternal pelvic dimensions, the amount of the disproportion, and the type. Considers the morphology of the pelvis in relation to the disproportion, also considering such things as the age of the mother, prior births and pregnancies.

9. Performer records any relevant observations concerning the position and presentation of the fetus, the stage

TASK DESCRIPTION SHEET (continued)

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This is page 3 of 3 for this task.

List Elements Fully

of the pelvis if dilation has begun, presence of unexpected multiple fetuses, fetal abnormalities, defects, or soft tissue masses of the maternal pelvis.

10. Performer considers whether there is the likelihood of a serious arrest of normal delivery, warranting cesarean section, whether it is a borderline case which could be dealt with by the use of forceps in normal delivery from below, or whether no serious arrest of delivery is anticipated. Performer may note other conditions observable on the radiographs which could account for the symptoms leading to the request for pelvimetry.

11. Depending on the stage of pregnancy (pre, early or late labor) and the nature of the request, performer may record findings and judgment on the feasibility of normal delivery on pelvimetry chart, may discuss with attending obstetrician, and/or may dictate report for later typing:

    a. In response to request, performer explains interpretations and conclusions verbally, indicating how conclusions were arrived at, including medical and technical considerations.
    b. In dictating or writing findings, indicates what implications can be drawn from findings and what conclusions and/or courses of action are warranted, including the possible need for additional studies, tests, or courses of action.
    c. Performer signs pelvimetry chart and requisition sheet.

12. Performer may decide that the material is unusual or of special interest and warrants inclusion in museum library, or should be used for study purposes. Marks radiograph jackets appropriately if so decided.

13. Returns pelvimetric and radiographic material, requisition sheet, and any tape of dictation to proper jacket, and places to be picked up for typing. Has pelvimetric charts returned.

TASK DESCRIPTION SHEET

Task Code No. 420

This is page 1 of 5 for this task.

1. What is the output of this task? (Be sure this is broad enough to be repeatable.)

Decision made with obstetrician on whether to proceed; radiograph with grid ordered; injection site for IUT selected; patient anesthetized; intrauterine transfusion needle inserted; position of needle checked with test injection of contrast medium; catheter inserted; final approval given on needle placement in fetal peritoneal cavity for IUT, or postponement and follow up care recommended.

2. What is used in performing this task? (Note if only certain items must be used. If there is choice, include everything or the kinds of things chosen among.)

Patient's x-ray requisition form, medical records, radiographs, ultrasonograms, scintillation scans; pen; view boxes; sterile tray with sedative, antiseptic solution, swabs, sterile drape, syringes, needles, transfusion needle, catheter, local anesthetic, iodine based aqueous contrast solution, scalpel;metal grid;marking pen;tape; sterile gown, gloves; emergency cart

3. Is there a recipient, respondent or co-worker involved in the task? Yes...(X) No...( )

4. If "Yes" to q. 3: Name the kind of recipient, respondent or co-worker involved, with descriptions to indicate the relevant condition; include the kind with whom the performer is not allowed to deal if relevant to knowledge requirements or legal restrictions.

Pregnant patient and fetus; obstetrician; radiologic tehcnologist; nurse

5. Name the task so that the answers to questions 1-4 are reflected. Underline essential words.

Conducting intrauterine fetal radiography for intrauterine transfusion in consultation with obstetrician by discussing and mutually deciding whether to go ahead;reassuring pt.;localizing fetus using grid for radiography after prior injection of contrast medium by obstetrician;deciding entry site;collaborating in use of local anesthetic,placement of transfusion needle;checking needle placement with test injection of contrast solution and radiography;approving final placement;assisting with introduction of catheter; giving final approval of placement for transfusion or recommending postponement, follow up care.

List Elements Fully

Performer receives the x-ray requisition form and medical information on a female patient scheduled for intrauterine fetal radiography such as in connection with intrauterine transfusion (IUT). Patient will already have been judged able to undergo procedure and will have had an aqueous iodine based contrast medium injected into the amniotic fluid where it will have been ingested and concentrated within the fetal gastrointestinal tract. Requisition may be for first of a series or any of a series of intrauterine transfusions.

1. Performer reads the patient's requisition form and relevant obstetrical and medical history to review material seen earlier or to become familiar with the case.

   a. Performer notes the patient's age, size and length of pregnancy. Reviews relevant radiographs on view boxes; examines any ultrasonograms or scintillation scans of the mother's abdomen showing the location and area of the placenta.

   b. Performer notes any relevant information on the patient's current condition, results of spectrophotometric analysis, past history with erythroblastosis fetalis (hemolytic anemia of the fetus due to RH incompatibility and

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6. Check here if this is a master sheet..(X)

TASK DESCRIPTION SHEET (continued)

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List Elements Fully

sensitization of patient), any indications that the fetus is hydropic or has any abnormalities which would hinder proper placement of the transfusion needle.

c. If the transfusion is one of a series, performer reviews prior radiographs of the fetus and reports of the prior procedures. Notes especially how mother and fetus tolerated the procedure, the extent to which prior attempts to enter the fetal peritoneal cavity was accompanied by unsuccessful penetrations in other areas of the fetus.

d. Performer notes information on prior instillation of the contrast medium, notes recommendations on technique such as use of transfusion needle with or without a catheter. Notes the cumulative radiation exposure to both the mother and the fetus.

e. Performer meets with the patient's attending obstetrician to discuss the procedure. Discusses the patient's current condition, the response to the instillation of the contrast. May go over the steps to be covered in the procedure with the obstetrician.

f. Performer checks to see that patient has signed consent for procedure. If not, informs appropriate co-worker and either has examination delayed until written consent is obtained or has obstetrician obtain at once.

2. Performer greets patient in examination room. May attempt to reassure patient and explain what will be done. Answers questions. Performer may examine patient; palpates abdomen to locate position of fetal head.

3. Unless there are obvious contraindications to going ahead, performer has patient and materials prepared. Has sedation administered if appropriate or decides to administer personally.

List Elements Fully

4. When informed that patient is ready, performer prepares for selection of the site for insertion of the transfusion needle:

   a. Has technologist expose the mother's abdomen while she lies on x-ray table. Has a stainless steel grid placed over the abdomen and uterus. Has this fixed behind the patient with tape.

   b. Performer orders anteroposterior preliminary radiographs to record the fetal structures in relation to the grid markings.

5. Performer views the radiographs on view box as soon as processed. May also inspect existing views of the placenta.

   a. Performer notes the degree of ingestion by the fetus of the contrast medium. Notes the fetal skeletal structures, whether the fetus is in a direct anteroposterior lie. If not, notes the location of the fetal spine (whether anterior or posterior).

   b. Performer assesses the likelihood and nature of any difficulty in entering the fetal peritoneal cavity due to the size or position of the fetus, a poorly opacified gut or a fetal abdomen concealed by the maternal skeletal structure.

   c. Perofrmer notes whether there are contraindications to continuing with the procedure such as any of the following:
      i) If the transfusion needle must enter the placenta to reach the fetal abdomen.
      ii) If the fetus is lying with its back anterior.
      iii) If there is inadequate opacification by the contrast medium.

TASK DESCRIPTION SHEET (continued)

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- d. If the fetus is in a direct antero-posterior lie and the performer is unable to determine whether the spine is anterior or posterior, performer may order a lateral film and review as described above after it is processed.
- e. Performer may reorder and indicate needed change in technical factors to technologist. If so reviews as above.

6. The performer and obstetrician decide whether there are contraindications to going ahead with the procedure based on evaluation of patient's condition and contraindications shown by preliminary films.
   - a. Performer and obstetrician may decide to wait until the fetal position is improved spontaneously or by obstetrician.
   - b. If performer and obstetrician decide not to proceed, may record reasons and any recommendations on patient's chart. Informs appropriate staff of cancellation. If appropriate, orders rescheduling of patient.

7. If the performer is to proceed, makes final decision on entry site:
   - a. Performer notes the location of the fetal bowel, outline of the anterior abdominal wall and/or the outline of the thigh in relation to the grid squares on the preliminary films.
   - b. If the radiographs are clear and the performer can determine the desired entry point, performer selects the most desirable grid square for use as entry site for needle.
   - c. If the baby is small and/or the fetal spine or gut is obscured by the maternal skeleton, performer may use other guides to choose entry site such as those parts of the fetal skeleton that are visible.

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   - d. Returns to patient and locates the particular grid square chosen as the entry site. Marks out the appropriate grid location and entry site on the patient's abdomen; may use sterile marking pen. May discuss with obstetrician and have this done.
   - e. Performer and obstetrician decide who will actually insert the needle.

8. Performer returns to patient in x-ray room when informed that patient and equipment are ready:
   - a. Checks whether patient has been properly positioned and prepared for sterile puncture procedure. If not acceptable, indicates the needed adjustments. May decide to position personally.
   - b. Checks sterile tray prepared for procedure. Checks that the transfusion needle (and catheter if appropriate) is ready as ordered. Checks that emergency cart is present. Checks proper shielding of anyone to remain in room.
   - c. Checks that syringe with iodine based contrast medium is ready. Checks appearance of contrast medium to be sure there is no chemical deterioration.
   - d. Dons leaded garments and sterile gown and gloves when appropriate.
   - e. Performer explains to patient what will be done. Answers patient's questions as appropriate. Reassures patient and does so as deemed needed throughout procedure. Explains that performer will ask patient to hold still from time to time during procedure, and does so as appropriate.

9. Performer or obstetrician anesthetizes the injection site:

TASK DESCRIPTION SHEET (continued)

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a. Swabs site of entry with prepared antiseptic solution. Covers surrounding areas with sterile drapes, leaving only small area for injection and puncture uncovered.
b. Checks amount of local anesthetic to be injected as shown by nurse in syringe or draws anesthetic into sterile syringe. Expels air and inserts needle intradermally and subcutaneously; injects. Removes needle; swabs site with sterile solution. Waits for area to become anesthetized.

10. Performer proceeds to place transfusion needle so that it enters the fetal peritoneal cavity with the minimum radiation exposure necessary to ensure accuracy:

a. Refers to radiographs to orient self and obstetrician. Performer may nick the skin with a scalpel at the entry point selected and marked.
b. When ready,performer guides obstetrician or personally positions the transfusion needle at the entry site as indicated by nick.
c. With needle in position directly over the fetal abdomen, performer (or obstetrician guided by performer) inserts the needle directly down through the maternal abdominal wall and uterus, into the amneotic cavity, and then into the lower half of the fetal abdomen (peritoneal cavity).
d. Performer notes (or has obstetrician note) the sudden loss of resistence signifying that the fetal peritoneal cavity has been entered.
e. Performer directs obstetrician or personally checks for correct entry by withdrawing the inner stylet from the needle and checking that there is no egress of fluid, or, if the fetus is hydropic, that ascitic

List Elements Fully

fluid emerges characteristically as under pressure.
f. If there is an oozing of liquid, performer and/or obstetrician may readjust needle or repeat insertion until a proper response is obtained from the needle.

11. Performer proceeds to check the needle placement with radiography:

a. Checks syringe containing contrast solution as selected. Performer decides on minimum amount to inject and attaches to transfusion needle or has this done by obstetrician.
b. Positions overhead x-ray tube to take view that will show location of needle.
c. Performer has patient hold still. Performer or obstetrician rapidly injects the contrast solution through the transfusion needle.
d. Has technologist take radiograph. Views radiograph on view box when it is brought or goes to automatic developer:
    i) Performer and obstetrician note the appearance of the contrast medium and check for the characteristic appearance of the fetal abdominal structures.
    ii) If the performer notes a nondiffusing blob of contrast at the tip of the needle, performer determines that the needle is in a solid part. Performer advances or pulls back the needle gently as appropriate and rechecks using a small amount of contrast and radiographic check until satisfied.
    iii) Performer judges whether the needle is in the amniotic cavity or in the fetal peritoneal cavity in the presence of massive ascites (accumulation of fluid in the peritoneal cavity)

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List Elements Fully	List Elements Fully
based on the extent of the diffusion of the contrast from the needle. e. If the performer and the obstetrician decide that the fetal small intestine has been perforated, may order antibiotics. f. If the performer and the obstetrician decide that the contrast has been injected pericardially, the performer or obstetrician attaches an empty syringe to the transfusion needle. Aspirates as much of the medium as possible. 12. When the performer and obstetrician are satisfied that the needle tip lies free in the fetal peritoneal cavity, performer may assist obstetrician in introducing a catheter directly into the fetal peritoneal cavity: a. Performer may thread a small-lumen flexible radiopaque catheter through the transfusion needle. b. Performer may assist obstetrician to thread a flexible catheter over the needle and into the cavity. If so, may have radiograph taken to check position; when satisfied, indicates that needle can then be withdrawn. 13. Performer indicates to obstetrician when any ascitic fluid can be aspirated and when appropriate amount of washed O-Rh positive erythrocytes can be instilled into the peritoneal cavity (to be absorbed into the fetal circulation). May discuss any related problems with obstetrician and/or answer questions. 14. If appropriate, performer may record aspects of the procedure and/or sign requisition sheet.	

TASK DESCRIPTION SHEET

Task Code No. 421

This is page 1 of 2 for this task.

1. **What is the output of this task?** (Be sure this is broad enough to be repeatable.)

Decision made on ordering and/or deciding on type of gynecological radiographic procedure; recommendations made on technique, preparatory patient procedures and care as appropriate; record entered and placed for scheduling.

2. **What is used in performing this task?** (Note if only certain items must be used. If there is choice, include everything or the kinds of things chosen among.)

X-ray requisition form and patient's chart; relevant radiographs, ultrasonograms; telephone; view boxes; pen

3. Is there a recipient, respondent or co-worker involved in the task? Yes...(x) No...( )

4. If "Yes" to q. 3: Name the kind of recipient, respondent or co-worker involved, with descriptions to indicate the relevant condition; include the kind with whom the performer is not allowed to deal if relevant to knowledge requirements or legal restrictions.

Physician requesting gynecological radiography; co-worker; secretary or clerk

5. **Name the task** so that the answers to questions 1-4 are reflected. Underline essential words.

Deciding on type of gynecological radiographic procedures to order for non-pediatric female patient in consultation with referring physician by reviewing case history and relevant materials, discussing lab reports, indications; considering contraindications and need; approving, recommending alternative studies, and/or refusing approval; if approved, recommending technique, medication, patient preparation; recording orders and recommendations; placing for scheduling and/or typing.

List Elements Fully

Performer decides whether to approve an examination procedure requiring gynecological radiography with the instillation of contrast media upon receipt of a request from a referring physician on an x-ray requisition form, by phone, or in person. Request may be for visualization of any or all of the female reproductive organs with the use of air and/or positive-contrast media (pneumoperitoneum with or without hysterosalpingography, hysterography, etc.). The request may be for an initial examination, an additional study or for a repeat of a study previously carried out.

1. Performer reads the x-ray requisition form and the patient's history to learn the nature of the problem and the reason for the request.

   a. Performer studies the medical history of the patient, materials resulting from earlier studies, and related reports. Notes whether patient has infectious or communicable condition; notes the patient's age and any history of pregnancies and/or fertility problems. Notes any history of allergy to iodine based substances, how patient tolerated earlier procedures (if any). Performer notes any evidence of pregnancy, uterine bleeding, inflammatory disease, pelvic tumors large enough to fill

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6. Check here if this is a master sheet..(X)

TASK DESCRIPTION SHEET (continued)

Task Code No. 421

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List Elements Fully

the true pelvis, cardio-vascular or severe pulmonary disease, or other related contraindications.

b. Depending on the nature of the request, performer may study laboratory reports, ultrasonograms, prior radiographs. Places radiographs on view boxes.

c. If the performer finds that the information provided is inadequate, performer arranges to have other materials sent or discusses with patient's physician.

d. Performer considers the request in terms of the need for the study, contraindications, and alternative studies; considers the cumulative radiation exposure of patient. Considers the severity of the symptoms, the extent of definition on any current radiographs, and/or the suddenness of the appearance of the abnormalities in relation to the contraindications and possible adverse effects on patient. Performer considers alternative studies which could fill the need for additional information with less pain, risk or radiation exposure (such as ultrasound, culdoscopy, serum study, laparoscopy). May discuss with another radiologist or appropriate specialist.

If appropriate, performer arranges to discuss the implications of the existing medical information with the patient's attending physician or gynecologist.

2. Performer decides whether to approve request, order a repeat of a prior study, additional or alternative studies, or recommend against radiography based on the information obtained and any discussion.

a. If performer recommends against the request, discusses with referring physician (if not already done) and

List Elements Fully

writes reasons for refusal on requisition sheet, or destroys requisition sheet if agreed to by referring physician.

b. Performer may suggest that laboratory tests be made prior to approval of study.

c. If performer and physician agree on alternative study, or if performer decides to approve the request for the study, performer may decide to make recommendations on technique, depending on nature of study and patient's condition. May discuss with gynecologist.

d. Recommendations on technique include such things as prior preparation of patient before procedure, including timing of procedure in relation to menstrual cycle, prior abstinance from food intake, use of cleansing enema. (Performer may have patient given an instruction sheet.) Performer may recommend prior administration of tranquilizer and/or analgesic, and/or muscle relaxant and when to administer prior to the procedure. Performer may recommend the type of contrast medium or the route of entry for pelvic pneumography.

3. Performer writes orders as appropriate for agreed-upon procedures; writes recommendations on technique and for patient's preparation on patient's chart explicitly so that technologists and other personnel can prepare patient or be scheduled for work. Performer gives information to appropriate secretary for scheduling. Signs requisition sheet if appropriate.

TASK DESCRIPTION SHEET

Task Code No. 422

This is page 1 of 2 for this task.

1. What is the output of this task? (Be sure this is broad enough to be repeatable.)

Obstetrical and/or gynecological radiographic materials read, interpreted; conclusions drawn and recommendations made orally or dictated; attending physician called about emergency signs; selected radiographs earmarked for study or library use; material rejacketed, report placed for typing.

2. What is used in performing this task? (Note if only certain items must be used. If there is choice, include everything or the kinds of things chosen among.)

X-ray requisition forms; current radiographs, ultrasonograms, scintillation scans; view boxes; prior and collateral radiographic materials such as pelvimetry calculations; telephone, dictation equipment; pen; magnifying glass

3. Is there a recipient, respondent or co-worker involved in the task? Yes...(X) No...( )

4. If "Yes" to q. 3: Name the kind of recipient, respondent or co-worker involved, with descriptions to indicate the relevant condition; include the kind with whom the performer is not allowed to deal if relevant to knowledge requirements or legal restrictions.

Co-workers; clinicians; referring physician

5. Name the task so that the answers to questions 1-4 are reflected. Underline essential words.

Reading, interpreting and making recommendations on obstetrical and/or gynecological radiographic studies and related material or giving opinions to clinicians or co-workers by reviewing relevant medical information and requisition sheet(s), evaluating current and prior films and collateral materials; notifying referring physician of emergency signs; explaining opinions or dictating findings and recommendations; placing report for typing.

List Elements Fully

Performer reads and interprets completed radiographic obstetrical and/or gynecological examinations, or provides opinions to co-workers, obstetricians and/or gynecologists when requested, on interpretation and conclusions regarding radiographs involved with obstetrical or gynecological procedures.

1. If responding to request, performer goes to where radiographic material is on view. Listens while co-worker explains problem on how to proceed next or problem of interpretation.

   If reading and interpreting completed work, performer obtains the jacketed radiographic work-ups. Includes the current set of radiographs, ultrasonograms, scintilation scans, and pelvimetry studies (if appropriate), the relevant requisition sheets, and prior studies if available. Goes to reading area.

2. Asks about, reads, or reviews x-ray requisition forms and materials on patient's medical and obstetrical history (reason for request, decisions made on technique, comments from referring physician or consulting physicians, notes made during the procedure and interpretations made of procedures already completed).

   If reading and interpreting a completed study, places rele-

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6. Check here if this is a master sheet..(x)

TASK DESCRIPTION SHEET (continued)

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vant radiographs on view boxes, including earlier films. If responding to request, may ask to see earlier relevant films such as for prior similar studies, related collateral studies, or similar studies over time.

Performer considers possibilities of unsuspected pregnancy in studying gynecological material, and takes into account gynecological as well as obstetrical considerations when dealing with obstetrical material.

3. Performer reads and interprets the radiographic and related materials:
    a. Decides whether any abnormalities, changes, or suspicious signs warrant the immediate attention of the patient's clinician. If so, telephones at once and discusses findings (or recommends that co-worker in charge of case do this).
    b. For own work, decides what to report and what recommendations to make based on the type of information requested and the information revealed by the radiographs and related materials.
    c. In response to request, decides what to recommend to co-worker. Explains interpretation and recommendations verbally, indicating how conclusions were arrived at, including medical and technical considerations.

4. Performer dictates findings (for own work) by explaining what appears on the films. Describes worrisome or suspicious signs, abnormalities in female patient and/or fetus, and/or changes or lack of growth in fetus over time; refers to earlier films as appropriate. (Might indicate presence of artifacts which do not have medical significance).

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Indicates what implications can be drawn from findings and what conclusions and/or courses of action are warranted or contraindicated, including need for additional studies, tests, or courses of treatment. If appropriate, estimates and reports the maturity of the fetus based on estimate of its size and stage of development.

Dictates report in the style: There is ...on.... It has the characteristics of.... I believe that this indicates .... This could mean that.... It is necessary to determine whether.... This can be done by....

5. May decide whether any of the material is unusual or of special interest and warrants inclusion in museum library, or should be used for study purposes. Marks jackets appropriately if so decided.

6. Returns own patient's radiographic material, requisition sheet and tape of dictation to proper jacket, and places to be picked up for typing.

TASK DESCRIPTION SHEET

Task Code No. 423

This is page 1 of 2 for this task.

1. What is the output of this task? (Be sure this is broad enough to be repeatable.)

Presentation prepared and made on developments or case studies in obstetrical or gynecological radiology;presentations of obstetricians or gynecologists listened to; discussions participated in; conference opened, conducted, and closed, when appropriate.

2. What is used in performing this task? (Note if only certain items must be used. If there is choice, include everything or the kinds of things chosen among.)

Radiographic and medical equipment; radiographic materials; case histories; view boxes, slide projectors; ultrasonograms

3. Is there a recipient, respondent or co-worker involved in the task? Yes...(X) No...( )

4. If "Yes" to q. 3: Name the kind of recipient, respondent or co-worker involved, with descriptions to indicate the relevant condition; include the kind with whom the performer is not allowed to deal if relevant to knowledge requirements or legal restrictions.

Obstetricians;gynecologists; radiologists

5. Name the task so that the answers to questions 1-4 are reflected. Underline essential words.

Participating in meetings of radiologists,obstetricians, and gynecologists to discuss new developments, cases of interest and case problems of mutual interest by planning and presenting new developments in the radiologic field, interesting case studies or problems in current cases and/or by deciding to listen to presentations about new developments, interesting case studies or case problems, and participating in discussions; leading conference sessions when appropriate.

List Elements Fully

Performer attends meetings of medical staff and co-workers in obstetrics and gynecology to discuss areas of mutual concern.

1. Performer may prepare presentations describing new work in the fields of obstetrical and gynecological radiology:

   a. Performer decides what to present and in what degree of depth and detail.
   b. Decides on how to make presentation and what to use.
   c. May prepare outline,obtain special instructional materials, do research on topic for use in presentation. May have resident assist.
   d. May prepare slides from own source of radiographs, ultrasonograms or may obtain existing radiographic material and slides from library. May have resident assist.
   e. At meeting, when performer is called upon, places radiographs, spot films or other ultrasonograms on view box,clips to board, or uses slide projector. Describes work selected, answers questions, and participates in discussion. May recommend further reading.
   f. Performer, may, when appropriate, demonstrate or simulate new and/or relevant techniques, equipment or procedures.
   g. After presentation,performer replaces materials and equipment or has this done.

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TASK DESCRIPTION SHEET (continued)

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List Elements Fully

2. Performer may attend conferences at which obstetricians and/or gynecologists present case studies and raise the problems involved, or performer may choose cases which are of interest from the library or personal files which are of educational interest.

   a. Performer may be told beforehand by department head or conference leader what current or past cases will be presented for discussion, or performer will discuss the type of information to be covered in order to select relevant cases.
   b. Performer obtains the radiographic materials related to the cases selected or selects appropriate cases. May have assistant gather materials and reviews to be sure they are appropriate.
   c. Performer reviews the radiographs and the requisition sheets involved, and any other relevant medical information such as reports and interpretations already made.
   d. Performer may make notes to use as reference, pointing out fine points with regard to interpretation of the radiographs in connection with pathological symptoms and conditions.
   e. At the conference, performer presents the radiographs involved as appropriate, and presents interpretation; makes relevant points so as to instruct the audience in the reasoning involved. Participates in the discussion,as appropriate;answers questions. May suggest reference articles on subject.
   f. Performer replaces radiographic materials or has these replaced when done.
   g. If called on to lead conference,performer opens conference; calls on co-workers to present cases; leads or chairs discussions and question period; closes meeting.

List Elements Fully

   h. If current case studies are involved, performer may maintain files on the case(s) and read reports including final diagnosis and treatment prescriptions.

3. Performer may decide to attend presentation by co-workers, obstetricians, and/or gynecologists. May make notes, ask questions and/or participate in discussion.

4. Performer may decide to attend presentation about a particular case that is of interest. May make notes, ask questions and/or participate in discussion.

5. Performer may decide to present relevant problems that performer is personally having trouble with and ask for comments and suggestions from participants.

   a. Selects the case material needed to present the problem.
   b. Makes presentation and poses problems involved.
   c. Listens and participates in resulting discussions.

TASK DESCRIPTION SHEET

Task Code No. 424

This is page 1 of 2 for this task.

1. What is the output of this task? (Be sure this is broad enough to be repeatable.)

Radiology resident shown and explained obstetrical and gynecological radiography procedures; resident evaluated for readiness to do activities under supervision; resident observed and criticized; resident evaluated for readiness to do tasks without direct supervision; resident's work spot checked and criticized; questions answered; opinions on work given as requested; evaluation noted informally.

2. What is used in performing this task? (Note if only certain items must be used. If there is choice, include everything or the kinds of things chosen among.)

X-ray requisition forms; materials and equipment needed for procedures in obstetrical and gynecological radiography; related radiographs and ultrasonograms; emergency equipment; view boxes

3. Is there a recipient, respondent or co-worker involved in the task? Yes...(X) No...( )

4. If "Yes" to q. 3: Name the kind of recipient, respondent or co-worker involved, with descriptions to indicate the relevant condition; include the kind with whom the performer is not allowed to deal if relevant to knowledge requirements or legal restrictions.

Radiology resident to be instructed in obstetrical and gynecological radiographic procedures; female pt. involved; clinicians; supervisor of resident

5. Name the task so that the answers to questions 1-4 are reflected. Underline essential words.

Providing clinical training for radiology residents in obstetrical and gynecological radiographic procedures by demonstrating procedures, explaining what is being done, answering questions; deciding when residents can perform tasks under direct supervision; observing and correcting; deciding when tasks can be done without direct supervision; spot checking and correcting; advising as requested or as deemed necessary.

List Elements Fully

Performer provides clinical training to residents in radiology in the area of obstetrical and gynecological radiography, covering choice of examinations such as pelvimetry, fetal studies, hysterosalpingography, medical aspects of procedures, interpretation of radiographic material, alternative studies, and possible recommendations and treatments.

1. Performer provides demonstration, explanation, informal evaluation and supervision in: reading requests for radiographic procedures and deciding on best or altermative procedures; what to look for; available medical and technical procedures including types of examinations, anesthetics, surgical entry, use of contrast media, technical equipment, positions and angles, indications and contraindications; providing technical and medical interpretation of radiographic materials; learning range of medical conclusions that can be drawn, additional tests, and courses of treatment to consider.

2. When performer is assigned a resident, may select times, patients, and procedures to demonstrate, and may explain to resident while performer carries out own tasks:

    a. Performer explains what will be taught.

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TASK DESCRIPTION SHEET (continued)

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List Elements Fully

b. Performer may narrate the steps, may explain what is being done, or may explain the basis for decisions and actions.
c. Performer may decide to solicit questions to find out what the resident understands, may answer questions, or may elaborate on the explanation of what is being done, concentrating on the relevant skills and knowledges.
d. Performer decides when the resident has observed sufficiently and has a clear enough understanding of a procedure to carry it out under close, direct supervision and/or to assist.

3. Performer supervises and observes resident carrying out activities assigned.

a. Performer asks the resident to do all or part of a procedure and remains at the side of the patient or carries out own portion and watches the resident perform the assigned activity.
b. While observing, performer decides whether the activity is being done properly, whether there is a specific problem, whether there is need to demonstrate the procedure again or explain, and does so.
c. Performer may comment on the performance, encourage or correct as deemed necessary, or do this later.
d. Performer may decide to intervene and take over the procedure, explaining to the resident what was done incorrectly at that point or later.
e. If decision is to demonstrate again, performer may redo and have the resident observe, or have resident repeat the procedure until it is done properly.
f. Performer decides which procedures or activities can be done by the resident without direct supervision (although radiologist remains responsible). Informs proper supervisors, notes for own use, and/or tells this to resident.

List Elements Fully

4. Performer spot checks resident carrying out activities without direct supervision or responds to requests for guidance, assistance, or further instruction.

Performer proceeds as in steps 2 or 3 as appropriate, observing, noting areas needing improvement, determining nature of problem, assisting, giving opinions, answering questions, and providing further instruction on how to deal with unusual circumstances. Reinforces correct work. Suggests areas for improvement.

5. When patients are present for demonstrations, performer may explain presence of resident; when observing, performer may explain own presence.

6. Performer informally notes the extent of learning or proficiency of resident throughout the training:

a. May decide to discuss performance with resident at any time.
b. Does not keep formal records on what was taught, or on resident's progress.
c. May make personal notes for use in later evaluation meetings.

TASK DESCRIPTION SHEET

Task Code No. 425

This is page 1 of 2 for this task.

1. What is the output of this task? (Be sure this is broad enough to be repeatable.)

Outline and content planned and prepared for lecture to residents or case conference on obstetrical and gynecological radiology; lecture given; conference conducted by use of questions and answers.

2. What is used in performing this task? (Note if only certain items must be used. If there is choice, include everything or the kinds of things chosen among.)

Paper, pen; instructional and reading material in obstetrical and gynecological radiology; radiographic materials; projector and slides; ultrasonograms; screen; view boxes

3. Is there a recipient, respondent or co-worker involved in the task? Yes...(x) No...( )

4. If "Yes" to q. 3: Name the kind of recipient, respondent or co-worker involved, with descriptions to indicate the relevant condition; include the kind with whom the performer is not allowed to deal if relevant to knowledge requirements or legal restrictions.

Residents in radiology; program director; co-worker; library and/or clerical personnel

5. Name the task so that the answers to questions 1-4 are reflected. Underline essential words.

Planning and presenting lectures or case conferences on obstetrical and gynecological radiology for radiology residents by deciding on content, method of presentation; preparing material; presenting lecture, being aware of responses and adjusting presentation to students' needs; using radiographic material in question and answer format to demonstrate aspects of topics for instructional purposes.

List Elements Fully

Performer presents lecture(s) or holds case conferences on obstetrical and gynecological radiology for classes of radiology residents.

1. Performer is notified of assignment or decides what should be covered and at what depth and degree of detail, considering the residents' current academic level and objectives of the residency program.

2. Decides on method of presentation and plans lecture and/or case conference:

   a. Prepares outline.
   b. May obtain special instructional materials or asks co-worker to obtain for review. May use materials already prepared.
   c. May do research in topic area for use in lecture.
   d. May prepare slides from own source of radiographs (teaching cases) or may obtain existing radiographic and ultrasound material and slides from library. May ask co-worker to obtain for review, or personally chooses radiographs and ultrasonograms to illustrate problem cases for a question and answer session. Performer may choose materials to contrast normal and pathological states.
   e. Decides on time to allocate for questions and answers

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6. Check here if this is a master sheet..(x)

TASK DESCRIPTION SHEET (continued)

Task Code No. 425

This is page 2 of 2 for this task.

List Elements Fully	List Elements Fully
for lecture, or may choose residents to present case material for case study conference. If so, discusses as needed. 3. At a case conference, places radiographs, spot films or ultrasonograms on view box or uses slides and projector. May have resident(s) present material. Has residents give interpretations of materials. Throws out questions about materials; evaluates and responds to answers, or answers questions and participates in discussion about cases involved. Chooses how to present answers and comments so that residents will understand how answers were arrived at. 4. At a lecture, presents material as deemed appropriate. May note whether information is being understood, and adjust presentation accordingly. 5. Performer may recommend reading to students. 6. May make personal notes on residents for use in evaluation meeting. 7. Performer may keep material and notes prepared for future use; has materials taken from library and equipment returned. Note: Does not submit outline or materials for review. Does not formally test.	

TASK DESCRIPTION SHEET

Task Code No. 426

This is page 1 of 6 for this task.

1. What is the output of this task? (Be sure this is broad enough to be repeatable.)

Decisions made on whether to go ahead,on technique; contrast IV injected;site localized on monitor;anesthetic applied;teflon needle inserted into kidney with fluoroscopic control;urine aspirated and sent to labs;drainage tube attached;contrast solution injected;fluoroscopy done,spot films taken;radiographs ordered;complete set of pyelograms approved;contrast aspirated;drainage tube reinforced,sutured or removed;medical impressions and follow-up orders recorded,discussed with surgeon.

2. What is used in performing this task? (Note if only certain items must be used. If there is choice, include everything or the kinds of things chosen among.)

X-ray requisition form,pt.'s chart,radiographic materials,ultrasonograms;view boxes;pen;sterile tray with local anesthetic, iodine based contrast solution,syringes,needles,towels,suture materials,antiseptic solution,swabs,tourniquet,dressings,teflon puncture needle,drainage tubing,bag;sponge stick or towel clip;protective lead garments;sterile gown, gloves;fluoroscope,table,spot film device,TV monitor;specimen containers;labels;emergency cart

3. Is there a recipient, respondent or co-worker involved in the task? Yes...(X) No...( )

4. If "Yes" to q. 3: Name the kind of recipient, respondent or co-worker involved, with descriptions to indicate the relevant condition; include the kind with whom the performer is not allowed to deal if relevant to knowledge requirements or legal restrictions.

Non-pediatric patient to have percutaneous antegrade pyelography;radiologic technologist;referring physician;surgeon;nurse

5. Name the task so that the answers to questions 1-4 are reflected. Underline essential words.

Conducting percutaneous antegrade pyelography of any non-pediatric pt. by deciding whether to go ahead; reassuring pt.;deciding on site of entry;localizing site with contrast IV and fluoroscopy;inserting teflon puncture needle in kidney with fluoroscopic control;aspirating urine;attaching drainage tube;injecting iodine based contrast solution;conducting fluoroscopy;taking spot films;ordering radiographs;deciding when examination is completed by viewing pyelograms;aspirating contrast;leaving drainage tube in place,suturing, or removing;discussing with surgeon; sending specimen to labs;recording medical impressions,orders for follow-up care.

List Elements Fully

Performer receives the x-ray requisition form and medical information on a patient scheduled for percutaneous antegrade pyelography (radiography of upper urinary tract after direct injection of contrast solution into a kidney that has been demonstrated to be distended with urine). Patient will already have undergone prior IVP, and/or renal angiography, and/or ultrasound examination.

1. Performer reads the patient's requisition form and relevant medical information to become familiar with the case or to review material seen earlier.
   a. Performer notes patient's age, sex, and size. Reviews any diagnostic information already collected including lab reports.
   b. Performer examines prior urographic studies on view boxes and any ultrasonograms. Performer notes the side of interest, the nature and location of the suspected blockage, the extent of the visualization of the organs. Reviews confirmation of existing hydronephrosis (distension of pelvis and calyces of kidney) and considers location of kidney and puncture site.
   c. If performer decides that further information is needed, may contact referring physician or surgeon and discuss.

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6. Check here if this is a master sheet..(x)

TASK DESCRIPTION SHEET (continued)

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  - d. Performer notes any special requests for radiographic views, recommendations on technique, on entry site. Checks whether any pre-examination procedures have been ordered, such as administration of antibiotics; and, if so, whether these have been carried out. If not,arranges to have these done.
  - e. Notes records of how patient tolerated any previous procedures;whether patient has history of allergy, especially to contrast medium. Notes whether female may be pregnant and/or timing in relation to menstrual cycle. Notes whether patient has an infectious or communicable condition, and any other relevant medical information.
  - f. Checks to see that patient has signed consent for procedure. If not, informs appropriate co-worker; arranges to have this done or delays until written consent is obtained.

2. Performer greets patient in examination room. Attempts to reassure patient; explains what will be done. Answers questions. Questions female to be sure that there is no danger of possible pregnancy. Examines patient and notes relevant symptoms. May have patient lie prone on table; palpates lumbar area to feel size, condition and location of kidney. If appropriate, explains procedure, risks, etc.,and obtains patient's consent for the procedure. (Does not continue without consent.)

3. Performer considers whether patient's current condition presents any contraindications to going ahead with the procedure. May have clinician or specialist called; discusses patient's condition and any alternative steps; decides whether to proceed or not based on evaluation of patient's condition and contraindications.

List Elements Fully

4. If performer decides not to proceed, records reasons and any recommendations on patient's chart. Informs appropriate co-worker of cancellation and has patient returned to room. If appropriate, orders rescheduling of patient or scheduling for alternative procedure.

5. If performer decides to proceed, decides on technique and probable site of entry based on requisition sheet, prior urographic materials and own examination. If appropriate, writes decisions on requisition sheet and informs appropriate co-workers so that patient, materials and technical factors for fluoroscopy can be prepared or set. Indicates sizes for needles, amount of contrast material, as decided.

6. If performer decides that further visualization is needed to localize entry site, performer may arrange to have an intravenous injection of contrast solution administered, or decides to do personally. If so, proceeds as follows:

  - a. Performer has patient prepared for intravenous injection of contrast solution. Exposes arm; applies tourniquet; finds vein and swabs entry site with antiseptic solution.
  - b. Performer asks for or selects prepared dose of radiopaque solution in hypodermic; checks that there is no deteriortation and for proper amount; expels air in syringe. Performer inserts needle into vein, removes tourniquet, and injects contrast solution. Removes needle and swabs site. Waits appropriate amount of time for contrast solution to reach the kidney.

TASK DESCRIPTION SHEET (continued)

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This is page 3 of 6 for this task.

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7. Performer orders scout film (with or without prior IV injection of contrast) and examines on view box when ready:

   a. Performer considers whether the distended pelvis and calyces of kidney are visible, whether the technique is satisfactory, whether the position of the patient is correct, and whether the view needed is obscured in any way.
   b. If the scout is not satisfactory, performer indicates the needed changes in exposure technique or in the patient's position to technologist.
   c. If fluoroscope has spot film attachment that uses cassettes, performer has cassette inserted. Chooses full, half, or quarter format and sets up as appropriate. (If roll film attachment, checks that attachment is loaded with film or has this done.)
   d. Performer makes final decision on site of puncture and has patient prepared in prone position on tilt table for the kidney puncture with the puncture site exposed.
   e. Decides on amount of contrast based on the patient's size, age, condition, the observed degree of distension of the kidney and location of the obstruction.

8. Prepares for procedure:

   a. If not already done, performer has needles and syringes needed in procedure prepared; may assemble the needle for kidney puncture.
   b. Dons protective lead garments and sterile gown and gloves.
   c. Checks prepared syringe of iodine based, aqueous contrast solution selected for injection, checking that quantity is correct and appearance shows no deterioration.
   d. Checks that anyone to remain in room during exposure is properly shielded.

List Elements Fully

9. When informed that patient and materials are ready, performer checks whether patient has been properly prepared and shielded. Performer indicates any needed adjustments.

   a. Reassures patient and does so as deemed needed throughout procedure. Explains that performer will ask the patient to hold breath from time to time during procedure, and does so as appropriate.
   b. Performer checks that all materials needed for procedure and emergency cart are present. Requests any missing objects.
   c. Cleanses site of puncture by swabbing with prepared antiseptic solution. Covers surrounding areas with sterile towels, leaving only small area for puncture uncovered.
   d. Performer prepares syringe with local anesthetic. Inserts needle subcutaneously and intradermally, and injects anesthetic. Waits for anesthetic to take effect.

10. Performer uses fluoroscopy to locate the exact site for the puncture:

   a. Performer positions overhead fluoroscope unit over patient; may have lights in room dimmed. Activates fluoroscope or has this done by technologist. Performer adjusts unit until the kidneys are visible on the TV monitor. May indicate needed adjustment in technical factors to technologist. May reposition patient.
   b. Performer selects the exact point of entry so that the puncture needle will enter a calyx of the renal pelvis if possible. May cut a tiny nick in skin at site with sterile scalpel.
   c. Performer positions appropriate size puncture needle (equipped with stylet and teflon sheath)

TASK DESCRIPTION SHEET (continued)

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List Elements Fully

over the entry site (or nick). May view location of needle on the TV monitor. Adjusts needle to the proper angle for entry. (May use sponge stick or towel clip to avoid placing hands directly in path of radiation beam.)

11. Performer asks patient to hold breath and attempts to penetrate the kidney so as to enter a calyx of the renal pelvis. Directs needle into kidney and feels for the characteristic give which indicates that the kidney has been penetrated. Notes whether hub of needle moves synchronously with respiration.

    a. Performer checks for proper entry by attempting to obtain urine:

        i) Performer attaches empty syringe to teflon sheathed needle.
        ii) Performer aspirates syringe to draw a free flow of urine from the kidney.
        iii) If performer observes blood or no urine in syringe, performer pulls back needle or inserts further and repeats attempt to obtain urine.
        iv) If performer decides that proper entry has not been accomplished, repeats procedure as appropriate until satisfied. May select another entry site and repeat until sure of proper entry.

    b. Once performer has decided that proper entry has been accomplished, performer continues to aspirate urine in amount to approximate the amount of contrast solution to be injected. Removes syringe and ejects urine into appropriate sterile containers. Has containers capped, properly labeled, and sent to bacteriology and cytology labs for testing. May record amount and condition of urine withdrawn on patient's chart.

    c. Performer withdraws needle, leaving teflon sheath in place. Performer attaches a tube to the teflon sheath for introduction of contrast and for later drainage into an appropriate receptacle. May tape sheath into position to prevent movement or may suture by looping one or two stitches around needle.

12. Performer injects the contrast medium in the appropriate dosage based on patient's condition and/or amount of urine withdrawn.

    a. Performer injects through the drainage tube attached to the teflon sheath, using the syringe with the contrast solution. Notes passage of contrast on TV monitor. May observe presence and activity of peristalsis in the ureter and renal pelvis.
    b. Performer notes the adequacy of the filling;may reposition patient as appropriate. Studies any blockage, obstruction or other signs of pathology and other areas of interest.
    c. Performer decides what to record as spot films while viewing on TV monitor. Activates spot film attachment and x-ray foot pedal as appropriate. If cassette attachment, may have technologist remove cassette as spots are snapped and insert additional cassettes, or does so personally.
    d. Performer injects additional contrast as needed. May have patient stand or sit up, or change position to accomplish filling. May hold and/or assist patient. May ask technician for assistance.
    e. Throughout procedure,performer observes patient for signs of ad-

TASK DESCRIPTION SHEET (continued)

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verse reaction to procedure. May decide to provide emergency care.

13. Performer may order overhead radiographs. If so, removes syringe, closes off tube, and specifies views, area of interest, and patient positions desired.

14. Performer looks at radiographs and spot films, in order, on view boxes as they are processed:

    a. Determines whether the pyelograms are technically adequate to demonstrate the area and condition under study and provide sufficient information to make possible a competent medical interpretation. Indicates as soon as possible any needed change in technical factors or positioning.
    b. Performer decides whether it would be desirable to inject more contrast, and/or whether another location should be entered and injected, based on the information already available on the pyelograms, the way in which the patient tolerated the procedure, and the patient's condition and cumulative exposure.
    c. If the performer decides to reinject in same location or another site, repeats relevant steps for procedure in appropriate location chosen until satisfied, as described above.
    d. When performer has determined that the radiographic examination has been completed, informs technologist.

15. Performer returns to patient and reassures.

    a. Performer attempts to remove as much contrast material as possible. Adjusts patient on tilt table as

List Elements Fully

appropriate and attaches empty syringe to tube.

    b. Performer adjusts inclination of table and pulls back on the syringe plunger so that the contrast medium will drain out by gravity and aspiration. Performer may note progress by looking at the image of the medium on the TV monitor.

16. Depending on clinician's or surgeon's request, performer may leave teflon sheath and tubing in place for drainage, or removes:

    a. If performer is to remove sheath, performer reassures patient. Removes drainage tube and has patient hold still while performer gently removes the teflon sheath. Swabs area. Decides on sterile dressing and orders, or applies personally.
    b. If performer is to leave sheath and drainage tube in place, performer may secure with additional adhesive tape or may suture as follows:

        i) May indicate to co-worker the suture material and needle size needed.
        ii) Performer threads suture needle of size chosen with suture material selected. Loops several stitches around needle.
        iii) Performer decides on dressing and bandage to apply. May apply personally or assign to subordinate, specifying what to use.
        iv) Attaches collection bag to end of tube to catch any draining urine.

17. When performer has determines that the examination has been completed,

TASK DESCRIPTION SHEET (continued)

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informs staff. Has appropriate clean up procedures carried out. 18. If appropriate, performer notifies surgeon of interpretation of radiographs and discusses advisability of surgery. May arrange to have patient taken to surgery. 19. Performer records impressions of procedure on patient's chart: a. Preliminary findings. b. How patient tolerated procedure. c. Any special nursing follow-up recommended, prescription for antibiotics to avoid infection. (May fill out drug order form.) d. Record of urine specimen sent to labs. e. May sign chart or requisition sheet.	

TASK DESCRIPTION SHEET

Task Code No. 427

This is page 1 of 6 for this task.

1. What is the output of this task? (Be sure this is broad enough to be repeatable.)

Decisions made on whether to go ahead, on technique; patient reassured; local anesthetic injected; needles and catheters inserted bilaterally into internal jugular veins with fluoroscopic and contrast check; iodine based contrast solution injected and seriography ordered for appropriate projections;complete set of radiographs approved;subtractions ordered; medical impressions and follow-up recommendations recorded; MD or surgeon informed or results.

2. What is used in performing this task? (Note if only certain items must be used. If there is choice, include everything or the kinds of things chosen among.)

X-ray requisition form,pt.'s medical chart,prior radiographs;pen;view boxes;sterile tray with antiseptic solution,vena tube,syringes,scalpels,forceps, scissors,needles,swabs,dressings,bandage,local anesthetic,Seldinger needles,plastic tubing,guide wires, catheters,saline solution;marking pen;tape;serial film changer;aqueous iodine based contrast solution; tilt table;fluoroscope,TV monitor;lead garments;consent form;emergency cart;sterile gown,gloves;shielding;phone;sterile drape

3. Is there a recipient, respondent or co-worker involved in the task? Yes...(X) No...( )

4. If "Yes" to q. 3: Name the kind of recipient, respondent or co-worker involved, with descriptions to indicate the relevant condition; include the kind with whom the performer is not allowed to deal if relevant to knowledge requirements or legal restrictions.

Any pt. to have retrograde jugular venography;accompanying adult;referring MD;radiologist;anesthesiologist;radiologic technologist;nurse;surgeon

5. Name the task so that the answers to questions 1-4 are reflected. Underline essential words.

Conducting retrograde venography of the internal jugular veins,posterior fossa dural sinus system and/or orbit of any pt. by examining,reassuring pt.;deciding whether to go ahead;deciding on technique;injecting local anesthetic;applying compression;inserting needle and catheter bilaterally in internal jugular veins using Seldinger technique;checking for location and obstruction with fluoroscopic control;injecting iodine based contrast solution and ordering seriography for appropriate projections;ordering subtractions;approving final set of radiographs;ordering after care;recording,reporting medical impressions.

List Elements Fully

Performer receives the x-ray requisition form and medical chart of a patient scheduled for jugular fossa, cavernous sinus and/or orbital venography by way of retrograde injection of contrast into the internal jugular veins.

1. Performer reads the patient's requisition form and relevant information to become familiar with the case or to review materials seen earlier.
   a. Notes patient's age and sex;reviews test results and interpretation of plain radiographs (such as orbital views) or cavernous venus and/or orbital venograms done previously through injection of the frontal vein. Studies prior radiographs on view boxes to become familiar with the available diagnostic information and the nature and location of the suspected pathology, such as occlusion or compression in the venous system at the base of the skull or internal jugular veins, tumors of the area, such as of the pituitary. Notes whether information requested is for preoperative study of transsigmoid approaches to the temporal bone and cerebellopontine angle.
   b. Notes recommendations on technique and whether bilateral or unilateral in-

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6. Check here if this is a master sheet..(X)

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jection is required, whether visualization is to be up to the jugular bulb or into the inferior petrosal sinus. Notes whether prior sedation and/or general anesthesia has been ordered or suggested. Notes whether use of subtraction is suggested.

c. Notes any other medically relevant information such as history of adverse reaction to iodine based contrast material, whether female patient is pregnant, whether patient has an infectious or communicable condition. May call clinician to obtain additional information.

d. Checks to see that patient or authorized adult has signed consent for procedure. If not, informs appropriate co-worker and either has examination delayed until written consent is obtained or arranges to obtain personally before sedation.

2. Performer greets non-infant patient and any accompanying adult in examination room. Attempts to reassure; explains what will be done.

   a. May question about patient's symptoms in relation to the condition being studied. May collect additional medical history and ask about previous radiography, allergies.
   b. Determines whether female patient of childbearing age may be pregnant.
   c. Performer examines the patient for relevant neurological symptoms. Examines and palpates neck bilaterally to locate appropriate site(s) for percutaneous puncture(s).
   d. Performer may explain or demonstrate use of equipment to a child to allay fears and enlist cooperation; answers questions. Explains that patient will be asked to hold still from time to time. Indicates what will happen, what pain might be experienced, and what cooperation will be needed. Stresses need to maintain positions when ordered.
   e. If appropriate, performer may describe the procedure and its risks and obtain consent signature from patient or authorized adult. (Does not proceed without signed consent.)

3. Performer notes whether there are contraindications to going ahead with the procedure. May have clinician or specialist called; discusses patient's current condition and any alternative steps.

   a. Performer decides whether to proceed or not based on examination, evaluation of patient's condition, allergy.
   b. If performer decides not to proceed, records reasons and any recommendations on patient's chart. Informs appropriate co-worker of cancellation. If appropriate, orders rescheduling of patient or scheduling for alternative procedure.
   c. With pediatric patient performer may consider whether general anesthesia (if suggested) is still warranted; may decide to order if patient's behavior and condition suggest the need. If general anesthesia is to be carried out, performer discusses with anesthesiologist when it is to be administered and awaits indications from anesthesiologist as to when to proceed.

4. If performer decides to proceed, makes final decision on technique, based on requisition sheet and own examination of patient:

   a. Decides on appropriate equipment such as sizes of needles, catheters, guide wires, type and amount of con-

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trast solution, use of seriography, subtraction, injection equipment.

b. If general anesthesia is to be administered, indicates to anesthesiologist that procedure is to start and allows for appropriate timing.

c. May have patient sedated.

d. Has technical factors set for fluoroscopy. Indicates requirements for seriography. If a bi-plane study is involved, orders projections and angulation. Selects timing and simultaneous or sequential filming. Has equipment checked.

e. Informs appropriate co-workers of decisions so that patient and materials can be prepared.

5. Performer orders scout film(s) as appropriate for single or bi-plane views:

a. When processed, performer places scout films on view boxes and examines as soon as they are processed. Performer considers whether the areas of interest are visible, whether the technique is satisfactory, and whether the position(s) of the patient are correct.

b. If the scouts are not satisfactory, performer indicates the needed changes in technique or in the patient's position to the radiologic technologist.

c. Performer may examine the scout films to note any areas of possible complications.

6. Performer returns to patient in x-ray room when informed that patient and equipment are ready:

a. Checks whether patient has been properly shielded, immobilized and properly prepared for sterile puncture(s) (in the neck). If not acceptable, indicates the needed adjustments. May decide to immobilize personally.

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b. Checks sterile tray prepared for procedure. Checks that emergency cart is present. Requests any missing objects.

c. If general anesthetic is to be administered, checks with anesthesiologist to be sure that the patient is ready for procedure to begin.

d. Performer checks that appropriate needles and catheter sizes are present, that catheters are preformed as appropriate. Checks guide wires.

e. Checks that syringes with saline solution are prepared, that syringes with contrast medium are ready, that seriographic equipment is functioning. Checks appearance of contrast medium to be sure there is no chemical deterioration.

f. Dons protective lead garments and sterile gown and gloves when appropriate.Checks staff shielding.

g. Performer may prepare or check percutaneous needles to be used with Seldinger technique. May prepare syringes with local anesthetic and/or contrast if appropriate.

h. If patient is coherent, performer explains what will be done. Answers patient's questions as appropriate. Reassures patient and does so as deemed needed throughout procedure.

7. Performer prepares the site(s) for injection of the local anesthetic and insertion of the needle(s):

a. Has patient placed in the Trendelenburg position with head somewhat down so that veins in neck will be distended.

b. Performer prepares the sites for bilateral entry of needles (lateral to common carotid artery in midportion of neck under anterior border of sternomastoid muscle). Swabs entry sites with prepared antiseptic solution. Has surrounding areas covered by sterile drape.

TASK DESCRIPTION SHEET (continued)

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c. Performer marks the anterior border of the stermomastoid muscle as a guide.
d. Performer may distend the veins to be punctured by applying a sling of sterile plastic tubing looped about the neck and pulled to occlude the vein below the puncture site.
e. Checks amount of local anesthetic to be injected as shown by nurse in syringes or draws anesthetic into sterile syringes. Expels air and inserts each needle in turn so that the skin, subcutaneous tissue and soft tissue around the corotid sheath are infiltrated by injection of anesthetic. Removes needle; waits for areas to become anesthetized.

8. When the entry areas have become anesthetized performer makes sure that the entry sites are distended and prepares for puncture:

a. Performer uses scalpel to make a small incision at the medial border of the sternocleidomastoid muscle 3 to 4 cm. above the clavicle (to facilitate entry of needle and catheter).
b. For each entry performer has patient hold still. Performer attempts to penetrate the vein at the incision created while palpating and fixing vein. Performer inserts needle in cephalad direction from medial to lateral.
c. Performer pulls out the needle's inner stylus;attaches vena tube to needle;suctions back and checks needle entry by noting whether venal blood appears. May pull back on needle and reinsert or make other insertions until the needle tip is judged within the lumen of the vein. Removes vena tube. May attach syringe with saline to needle and flush entry site periodically.

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9. For each site performer inserts a safety guide wire into the needle and advances this cephalad into the vessel until the bony roof of the jugular fossa is felt as an abrupt tapping sensation (somewhat softer with tumor present).

a. Once the guide wire is inserted performer withdraws the hollow needle, compressing the vein to reduce the bleeding. Inserts the appropriate size catheter into the incision and over the guide wire.
b. Performer advances each catheter in turn using the guide wire as a leader until the catheter is at the desired level at the jugular bulb or the orifice of the inferior petrosal sinus.
c. Performer may warn patient of possible pain in the ear as the jugular foramen is approached. Comforts and reassures patient.
d. When the performer is ready to check the catheter position,pulls out the guide wire. Wipes off blood.
e. Reflushes with saline.

10. Performer prepares to check the placement of the catheters using fluoroscopic control:

a. Performer positions the overhead fluoroscope unit over the patient; may have lights in room dimmed; activates the fluoroscope; adjusts technical factors or has this done.
b. Performer connects syringes prepared with contrast solution to each catheter in turn. Injects a small amount of the solution into the vein. Removes syringe. May have manual pressure applied to jugular veins.

TASK DESCRIPTION SHEET (continued)

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c. Performer observes the location of each catheter and the flow of the test dose of contrast through the areas of interest.
   i) If catheter tip(s) require repositioning does so until position is judged satisfactory.
   ii) Performer notes any signs of occlusion, obstruction in the cavernous sinus or jugular fossa. Based on observation decides on appropriate force of injection and on amount of contrast that will be required (30 to 40 mm. and high pressure to fill the internal jugular vein, posterior fossa dural sinuses and communicating venous circulation; much less contrast and minimal force if obstruction is encountered so as to avoid possible rupture).

d. Once catheter positions are satisfactory performer has them taped into position. May reflush with saline.

11. Performer prepares to fill the internal jugular veins, jugular bulb, inferior petrosal sinus, cavernous sinus and orbital veins in sequence depending on the areas of interest. Arranges for compression, injection and mid-injection serial radiography for each projection to be filmed bilaterally:

   a. If appropriate, performer decides on and rehearses the patient or staff member who will apply manual compression as required (to prevent antegrade flow during filling and filming of anteroposterior and lateral projections).
   b. Orders the amount of contrast for each hand injection.
   c. Selects the rate of films per second and the number of films for each seriographic set of films and informs radiologic technologist. Indicates the proper timing.

List Elements Fully

   d. If not already done, arranges to have plain films taken before each injection so that subtraction masks may be prepared.

12. For anteroposterior and lateral projections (and basal if appropriate) performer carries out the following steps as appropriate for the projection:

   a. Performer has overhead x-ray tubes positioned for serial filming; confirms with the technologist the rate of filming and length of time selected. Has patient hold steady.
   b. Has compression applied as rehearsed. Has patient positioned appropriately for each projection.
   c. Tells technologist when to activate the rapid film changer(s) to automatically take the series of radiographs at the pre-programmed rate in relation to the injection of the contrast solution.
   d. Performer injects the contrast solution bilaterally by hand, applying the pressure and amount as decided. For lateral projection performer selects side for contrast injection, and injects saline in the other side. Notes any signs of resistence to avoid rupturing the vessels.
   e. Repeats appropriate steps for additional projections as decided.
   f. May order subtractions. Arranges to see radiographs as soon as they are processed.

13. While serial films are being processed, performer examines and talks to patient (if conscious) to evaluate how the patient has responded to the procedure and the injections. Reflushes catheters. May decide to provide emergency care at any time throughout procedure if patient shows signs of adverse reactions.

TASK DESCRIPTION SHEET (continued)

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List Elements Fully

14. Performer looks at the serial radiographs on view boxes in sequence as soon as they are processed:

    a. Checks for technical quality and notes whether any irregularities are due to artifacts or actual pathological or abnormal conditions, and whether the views are clear enough for interpretations (after subtraction). Performer may ask opinion of another radiologist.
    b. Performer decides whether it would be desirable to inject more contrast based on the information already available on the films, the way in which the patient responded to the procedure, and the patient's condition and cumulative exposure.
    c. If the performer decides to re-inject contrast for repeat or additional filming, repeats relevant steps for procedure as appropriate until satisfied. Repeats review of radiographs as described above until satisfied.
    d. Notes whether bilateral filling was uniformly obtained, presence of patent cross channels (for safe transsigmoid operation).
    e. Indicates to technologist any required changes in technique. May select radiographs from which to prepare subtractions.

15. Performer decides when the radiographic examination is completed. Informs anesthesiologist (if present) and technologist that procedure is to be terminated.

    a. Performer returns to the patient. If patient is conscious, performer reassures.
    b. Removes any tourniquets; removes any connecting tubes or syringes from catheter(s).

List Elements Fully

    c. Performer gently and slowly withdraws the catheter(s), manipulating by turning and pulling, taking care not to injure the vessel or enlarge the wound at the entry point.
    d. Performer compresses each vessel at the puncture site with the fingertips or sterile gauze for an appropriate amount of time to stop the bleeding and avoid hematoma. Performer then has pressure dressings applied.
    e. Has appropriate sanitary clean up procedures carried out.
    f. If requested, calls surgeon or clinician and reports preliminary results and findings.
    g. Reviews subtraction films when ready as described above. May order second-order subtractions if image is not deemed sharp enough; repeats additional review as required.

16. Performer records impressions of procedure on patient's chart:

    a. Preliminary findings.
    b. How patient tolerated procedure.
    c. Any follow-up care recommended or ordered.
    d. May sign chart or requisition sheet.

TASK DESCRIPTION SHEET

Task Code No. 428

This is page 1 of 6 for this task.

1. What is the output of this task? (Be sure this is broad enough to be repeatable.)

Decisions made on whether to go ahead,on technique, on site of injection;patient reassured;local anesthetic injected;needle inserted into frontal vein;test dose of contrast administered;compression selected and applied;iodine based contrast solution injected and seriography ordered for appropriate projections; subtractions ordered;complete set of radiographs approved;medical impressions and follow-up recommendations recorded.

2. What is used in performing this task? (Note if only certain items must be used. If there is choice, include everything or the kinds of things chosen among.)

X-ray requisition form,pt.'s medical chart,prior radiographs;pen;view boxes;sterile tray with antiseptic solution,vena tube,syringes,forceps,scissors,needles,swabs,dressing,bandage,local anesthetic,scalp vein needles and attached tubing,saline solution;head bands;serial film changer;aqueous iodine based contrast solution;tilt table;fluoroscope,TV monitor;lead garments;consent form;emergency cart;sterile gown, gloves;shielding;phone

3. Is there a recipient, respondent or co-worker involved in the task? Yes...(x) No...( )

4. If "Yes" to q. 3: Name the kind of recipient, respondent or co-worker involved, with descriptions to indicate the relevant condition; include the kind with whom the performer is not allowed to deal if relevant to knowledge requirements or legal restrictions.

Any patient to have orbital venography;accompanying adult;referring MD;radiologist;anesthesiologist; radiologic technologist; nurse

5. Name the task so that the answers to questions 1-4 are reflected. Underline essential words.

Conducting orbital and/or cavernous sinus venography of any patient by frontal vein route by examining,reassuring patient;deciding whether to go ahead;deciding on technique;injecting local anesthetic;applying compression;inserting needle in frontal vein;injecting test dose and selecting compression under fluoroscopic control;having compression applied and injecting iodine based contrast solution with simultaneous seriography for appropriate projections;ordering subtractions; approving final set of radiographs;ordering after care; recording medical impressions.

List Elements Fully

Performer receives the x-ray requisition form and medical chart of a patient scheduled for orbital and/or cavernous sinus venography (study of the veins about the base of the skull, orbit, and the cavernous and inferior petrosal sinuses after injection of contrast into the frontal vein).

1. Performer reads the patient's requisition form and relevant information to become familiar with the case or to review materials seen earlier.
   a. Notes patient's age and sex; reviews test results and interpretation of plain radiographs, such as orbital views taken prior to this examination, to become familiar with diagnostic information and the nature of the suspected pathology (usually lesions in the orbital apex, superior orbital fissure, cavernous sinus, pituitary enlargement, or related pathologies of the orbital venus system and sinuses. Notes history of symptoms. Notes whether one or both orbits are to be studied. Views radiographs on view boxes.
   b. Notes any other medically relevant information such as history of adverse reaction to iodine based contrast material, whether female patient is pregnant, whether patient has an infectious or communi-

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6. Check here if this is a master sheet..(x)

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cable condition. May call clinician to obtain additional information.

   c. Notes the regions to be visualized, recommendations on technique and use of subtraction, whether general anesthesia has been suggested.
   d. Checks to see that patient or authorized adult has signed consent for procedure. If not, informs appropriate co-worker and either has examination delayed until written consent is obtained or arranges to obtain personally before sedation.

2. Performer greets non-infant patient and any accompanying adult in examination room. Attempts to reassure; explains what will be done.

   a. May question about patient's symptoms in relation to the condition being studied. May collect additional medical history and ask about previous radiography, allergies.
   b. Determines whether female patient of childbearing age may be pregnant.
   c. Performer examines the patient for neurological symptoms; palpates forehead area to assess ease of frontal vein entry and appropriate site.
   d. Performer may explain or demonstrate use of equipment to a child to allay fears and enlist cooperation; answers questions. Explains that patient will be asked to hold still from time to time. Indicates how pressure will be applied or how patient's help will be enlisted to apply pressure from time to time. Stresses need to maintain positions.
   e. If appropriate, performer may describe the procedure and its risks and obtain consent signature from patient or authorized adult. (Does not proceed without signed consent.)

List Elements Fully

3. Performer notes whether there are contraindications to going ahead with the procedure. May have clinician or specialist called; discusses patient's current condition and any alternative steps.

   a. Performer decides whether to proceed or not based on examination, evaluation of patient's condition, allergy.
   b. If performer decides not to proceed, records reasons and any recommendations on patient's chart. Informs appropriate co-worker of cancellation. If appropriate, orders rescheduling of patient or scheduling for alternative procedure.
   c. With pediatric patient performer may consider whether general anesthesia (if suggested) is still warranted; may decide to order if patient's behavior and condition suggest the need. If general anesthesia is to be carried out, performer discusses with anesthesiologist when it is to be administered and awaits indications from anesthesiologist as to when to proceed.

4. If performer decides to proceed, makes final decision on technique, based on requisition sheet and own examination of patient:

   a. Decides on appropriate equipment such as sizes of needles, contrast solution, use of seriography, subtraction, injection equipment.
   b. If general anesthesia is to be administered, indicates to anesthesiologist that procedure is to start and allows for appropriate timing.
   c. May have pediatric patient sedated.

TASK DESCRIPTION SHEET (continued)

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d. Has technical factors set for fluoroscopy. Indicates requirements for seriography. If a bi-plane study is involved, orders projections and angulation. Selects timing and simultaneous or sequential filming. Has equipment checked.

e. Informs appropriate co-workers of decisions so that patient and materials can be prepared.

5. Performer orders scout film(s) as appropriate for single or bi-plane views:

a. When processed performer places scout films on view boxes and examines as soon as they are processed. Performer considers whether the areas of interest are visible, whether the technique is satisfactory, and whether the position(s) of the patient are correct.

b. If the scouts are not satisfactory, performer indicates the needed changes in technique or in the patient's position to the radiologic technologist.

c. Performer may examine the scout films to estimate the size of the blood vessel(s) involved and to note any areas of possible complications. Makes final decision about entry site.

6. Performer returns to patient in x-ray room when informed that patient and equipment are ready:

a. Checks whether patient has been properly shielded and immobilized; checks that the site of the injection has been properly prepared. If not acceptable, indicates the needed adjustments. May decide to immobilize personally.

b. Checks sterile tray prepared for procedure. Checks that emergency cart is present. Requests any missing objects. Checks that anyone to remain in room during exposure is shielded.

List Elements Fully

c. If general anesthesia is to be administered, checks with anesthesiologist to be sure that the patient is ready for procedure to begin.

d. Performer checks that appropriate size needles are present.

e. Checks that a syringe with saline solution is prepared, that syringe with contrast medium is ready, that seriographic equipment is functioning. Checks appearance of contrast medium to be sure there is no chemical deterioration.

f. Dons protective lead garments and sterile gown and gloves when appropriate.

g. Performer may prepare or check percutaneous needle to be used. May prepare syringes with local anesthetic and/or contrast if appropriate.

h. If patient is coherent, performer explains what will be done. Answers patient's questions as appropriate. Reassures patient and does so as deemed needed throughout procedure.

7. Performer prepares the site for injection of the local anesthetic and insertion of the needle:

a. Has patient placed in the Trendelenburg position (head down) so that veins in head will be distended.

b. If patient is able to cooperate, performer instructs patient in how to compress the external and internal jugular veins, using both hands. Performer may have this done by technologist or nurse. May decide to apply a collar to the neck to compress the jugular veins and distend the midline forhead vein.

c. Performer chooses the exact site for entry of needle. Swabs site of entry with prepared antiseptic solution.

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d. Checks amount of local anesthetic to be injected as shown by nurse in syringe or draws anesthetic into sterile syringe. Expels air and inserts needle. Injects anesthetic intradermally and subcutaneously. Removes needle; waits for area to become anesthetized.

8. When the entry area has become anesthetized performer makes sure that the entry site of the frontal vein is optimally distended and prepares for puncture:

   a. Chooses scalp vein needle as selected with polyetheline tubing attached. Has patient hold still. Performer attempts to penetrate the vein;inserts the needle in the direction of the orbit while palpating and fixing the vein.
   b. Performer attaches vena tube to needle; suctions back and checks needle entry by noting whether venous blood appears. May pull back on needle and reinsert or make other insertions until vein is successfully penetrated. Removes vena tube. May attach syringe with saline to tubing of needle and flush entry site periodically.

9. Once needle entry is judged appropriate performer allows patient or staff person to release pressure on neck, or has collar removed.

   a. Has tubing attached to needle cut near proximal end of needle.
   b. Performer connects syringe prepared with contrast solution to the tubing of the needle.
   c. May have lights in room dimmed;positions fluoroscope unit over patient. Has patient hold still.
   d. Has patient or staff member compress the anterior facial veins with the fingers. Injects a small test dose of the contrast solution into the vein and activates fluoroscope. Observes the flow of the contrast on the TV monitor.
   e. Performer judges what compression points are required to fill the opthalmic vein and to outline the cavernous sinuses on both sides, depending on the areas of interest. Has patient or staff person compress the facial veins with the fingers to occlude the flow of blood down the facial veins. May also apply compression of collateral veins, anterior facial veins over the maxillary regions, or veins on the supra-orbital ridge.
   f. May prevent the reflux of contrast over the scalp by placing a band around the hairline. Makes note of what compression to use for specific projections to be made during actual filming.
   g. Performer adjusts needle position if required while viewing on TV monitor. While noting the flow of the test dose performer decides on the appropriate amounts of contrast to inject and the speed and force to use for the injection.
   h. May flush with saline.

10. Performer prepares to fill the superior opthalmic vein, the cavernous sinus, the inferior petrosal sinus and the jugular bulb in sequence. Arranges for simultaneous compression, injection, and serial radiography for each projection to be filmed:

   a. Rehearses the patient or staff member who will apply the compression as required for anteroposterior, basal, and lateral projections.
   b. Selects the amount of contrast and force for each hand injection.

TASK DESCRIPTION SHEET (continued)

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  c. Selects the rate of films per second and the number of films for each seriographic set of films and informs radiologic technologist.
  d. If not already done, may arrange to have plain films taken before each injection for subtraction masks.

11. For anteroposterior, basal, and lateral projections performer carries out the following steps as appropriate for the projection:

  a. Performer prepares or checks syringe with the iodine based, aqueous contrast solution for correct quantity.
  b. Has patient or staff member apply compression as previously determined. Checks for adequate occlusion.
    i) For the anteroposterior projection has the patient's jaw slightly elevated.
    ii) For the basal projection has the patient's lower jaw projected below the level of the cavernous sinuses.
    iii) For the lateral projection performer decides whether one or both orbits are to be filled. Has patient or staff member compress veins in the upper medial quadrant of the orbit on the side not being studied while compressing the anterior facial vein on the side of interest.
  c. Performer has overhead x-ray tube(s) positioned for serial filming; confirms with the technologist the rate of filming and length of time selected.
  d. Has patient hold steady;tells technologist when to activate the rapid film changer(s) to automatically take the series of radiographs at the pre-programmed rate in relation to the simultaneous injection of the contrast solution. Injects the contrast solution by hand, applying the pressure and amount as decided.

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  e. Repeats appropriate steps for additional projections.
  f. May order subtractions. Arranges to see radiographs as soon as they are processed.

12. While serial films are being processed, performer examines and talks to patient (if conscious) to evaluate how the patient has responded to the procedure and the injections. Reflushes with saline.May decide to provide emergency care at any time throughout procedure if patient shows signs of adverse reaction.

13. Performer looks at the serial radiographs on view boxes in sequence as soon as they are processed:

  a. Checks for technical quality and notes whether any irregularities are due to artifacts or actual pathological or abnormal conditions, and whether the views are clear enough for interpretations (after subtraction). Performer may ask opinion of another radiologist.
  b. Performer decides whether it would be desirable to inject more contrast and/or whether another vein should be injected, based on the information already available on the films, the way in which the patient responded to the procedure, and the patient's condition and cumulative exposure.
  c. If the performer decides to re-inject in same or another location, repeats relevant steps for procedure in appropriate location until satisfied. Repeats review of radiographs as described above until satisfied.
  d. If proper filling is not obtained performer may decide to order

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another entry route such as retrograde internal jugular venography. If so, may arrange for scheduling at a later date.

e. Performer indicates to technologist any required changes in technique. May select radiographs from which to prepare subtractions.

14. Performer decides when the examination has been completed:

   a. Informs the anesthesiologist (if one is present) that the procedure is terminated.
   b. Returns to patient and gently removes the needle. Applies pressure to puncture wound to stop the bleeding. Orders dressing.
   c. If appropriate, has decontamination and/or sanitary clean up procedures carried out.
   d. May order cold compresses applied to eye.
   e. Informs staff that examination is terminated.
   f. Performer reviews subtraction films when ready as described above. May order second-order subtractions if image is not deemed clear enough; repeats review as appropriate.

15. Performer records impressions of procedure on patient's chart:

   a. Preliminary findings.
   b. How patient tolerated procedure.
   c. Any follow-up care recommended or ordered, new study ordered or suggested.
   d. May sign chart or requisition sheet.

TASK DESCRIPTION SHEET

Task Code No. 429

This is page 1 of 9 for this task.

1. What is the output of this task? (Be sure this is broad enough to be repeatable.)

Pt.examined;consent obtained;decisions made on going ahead,on technique;preparatory orders given;pt.reassured;site anesthetized;femoral artery punctured; guide wire and catheter advanced under fluoroscopy; orders given on pressure injection,serial filming; spinal angiograms ordered,approved;emergency reaction attended to;after care,delayed films and/or tests ordered;medical impressions recorded.

2. What is used in performing this task? (Note if only certain items must be used. If there is choice, include everything or the kinds of things chosen among.)

X-ray requisition form, pt.'s medical chart, radiographic records;pen;view boxes;sterile tray with antiseptic solution, drape, syringes, forceps, scalpel, scissors,needles,swabs,tape,pressure dressings,bandage,local anesthetic,puncture needles,guide wires, catheters, saline solution, anticoagulant; automatic injector; film changer;aqueous iodine based contrast solution; tilt table; fluoroscope,TV monitor; protective lead garments;consent form;emergency cart;sterile gown,gloves;shielding

3. Is there a recipient, respondent or co-worker involved in the task? Yes...(X) No...( )

4. If "Yes" to q. 3: Name the kind of recipient, respondent or co-worker involved, with descriptions to indicate the relevant condition; include the kind with whom the performer is not allowed to deal if relevant to knowledge requirements or legal restrictions.

Any pt.to have selective spinal cord angiography; authorized adult;attending MD; radiologist;anesthesiologist;surgeon;neurologist;radiologic technologist; nursing personnel

5. Name the task so that the answers to questions 1-4 are reflected. Underline essential words.

Conducting selective spinal cord angiography of any pt. by examining, reassuring pt.;deciding whether to go ahead;deciding on technique and prior preparation; injecting local anesthetic and puncturing femoral artery using Seldinger technique; checking catheter placement under fluoroscopic control; injecting aqueous iodine based contrast under pressure and taking serial films;evaluating arteriograms and deciding on additional selective opacification;repeating steps as appropriate; providing emergency care;approving final set of angiograms; removing catheter; ordering after care, delayed films; recording medical impressions.

List Elements Fully

Performer receives the x-ray requisition form and medical chart of a patient to be seen prior to performance of selective spinal cord angiography (radiographic contrast study of the blood vessels supplying the spinal cord, by selective introduction of contrast medium into the arteries from which the radicular contributors to the cord originate).

1. Prior to procedure (previous day or evening) performer reads the patient's medical history and requisition form to become familiar with the case and in order to make decisions about the conduct of the radiographic study:
   a. Performer notes the patient's age, sex,and size and the nature and location of the suspected pathology or symptomology, such as progressive deterioration of spinal cord function, prior surgery or embolization, arteriovenous malformations of spinal cord,lesions of spinal cord or vertebra.
   b. Performer notes whether request is for completion of a spinal cord study after one half of the vessels of the spinal cord have already been visualized, whether prior myelography and/or radioisotope angiography has been done. Performer reviews prior radiographs and radioisotope scans to become fam-

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6. Check here if this is a master sheet..(X)

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iliar with the diagnostic evidence already accumulated and to help pinpoint the vessels to be opacified.

c. Performer notes collateral clinical information such as blood work-ups, EKG,EEG, vital signs, renal function studies, chest radiographs, history of vascular constriction (ischemic episodes). Notes whether patient has other relevant or associated conditions or diseases which must be considered, or urinary tract infection, bedsores,or malnutrition needing correction prior to angiography. Notes whether female patient of childbearing age is pregnant.

d. Performer notes whether patient has had an allergy test to the contrast medium and its results. Notes results of clotting time tests if available.

e. Performer may discuss case with referring clinician,neurologist,or surgeon to obtain additional information.

f. If appropriate, performer orders additional tests,treatment for collateral conditions and/or a test for allergy to iodine based contrast material;reschedules own visit to patient if appropriate. Reviews results of tests before proceeding.

g. When ready to proceed with examination,performer may note recommendations on technique. Notes whether there is a consent for the procedure or must be obtained by the performer.

2. Performer visits patient and any authorized adult at bedside or in appropriate location. May arrange to be accompanied by clinician or appropriate specialist.

   a. Performer greets patient and/or authorized adult and explains that a brief examination will occur. If any colleagues are with performer, performer introduces them.

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   b. Performer reads patient's chart. Notes any new developments. Determines whether female patient of child bearing age may be pregnant. Reassures and answers questions. May ask patient or accompanying adult about symptoms and allergies.

   c. Performer examines patient for neurological symptoms of alertness, general state of consciousness, degree of paralysis (if any),and ability to move extremities. Feels femoral pulses and notes relevant body structures to determine best technique, site of entry,and sizes of catheters, needles.

   d. Performer considers whether there have been changes in the patient's condition since the decision was made to do the procedure, and considers whether there are contraindications to going ahead with the procedure. May confer with specialist, clinician, or surgeon; discusses patient's current condition. Decides whether to proceed or not based on assessment of patient's current condition and any discussion.

   e. If performer decides not to have procedure done, may discuss with clinician. Records reasons for cancellation and any recommendations such as alternative procedure on patient's chart. Informs staff of cancellation and discusses with patient.

3. If performer decides to proceed,and a consent for the procedure is needed, explains to patient or guardian in comprehensible language what will occur in the procedure, its purposes, and the dangers to the patient involved. Performer explains the alternatives; answers questions.

   a. When the performer is sure that the patient understands the risks, asks

TASK DESCRIPTION SHEET (continued)

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This is page 3 of 9 for this task.

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the patient for signature on consent form and checks that it is properly signed before patient is sedated.

b. If a guardian is to sign, performer explains to that individual as appropriate.

c. If a consent is not agreed to, performer postpones procedure until it is obtained. Discusses with appropriate physician or individuals and/or with patient. Does not proceed unless consent is obtained.

4. When a consent is obtained performer makes preliminary decisions on technique:

   a. Decides on use of general and/or local anesthetic. May discuss with anesthesiologist.
   b. Decides on segments of the cord to be studied and the vessels to be opacified.
   c. Decides whether the procedure should be scheduled for more than one session (unless the one currently to be scheduled is a continuation).
   d. Performer decides on appropriate equipment such as types and sizes of needles, catheters, guide wires, contrast solution, use of seriography, injection equipment.
   e. Performer makes final decisions on prior preparation of the patient such as sedation, period for withholding of food and/or drink, cleansing enema, shaving of entry site,use of antihistamine, use of a medication to deal with problems of blood clotting, IV drip, catheterization of patient's bladder.
   f. Performer records as appropriate so that patient can be prepared and staff assigned. May sign requisition; places for scheduling.

5. Just prior to the time for which the procedure is scheduled, the performer reviews all the relevant medical information and the patient's chart. Reviews relevant prior radiographs. Notes any new developments:

   a. Performer greets patient in examination room. May question about symptoms; reassures and explains what will occur. Examines patient, especially for choice of entry site at one of the femoral arteries.
   b. Performer checks that all prior preparatory procedures have been carried out. If not, arranges to have these done and/or decides to reschedule.
   c. Performer decides whether there are contraindications to going ahead with the procedure. May have clinician or specialist called; discusses patient's current condition and any alternative steps. Performer decides whether to proceed or not, based on evaluation of patient's condition and contraindications.
   d. If performer decides not to proceed, records reasons and any recommendations on patient's chart. Informs appropriate co-workers of cancellation and has patient returned to room. If appropriate, orders rescheduling of patient or scheduling for alternative procedure.

6. If performer decides to proceed, checks on the following:

   a. If general anesthesia is to be administered, performer arranges to have this done at the appropriate time; discusses with anesthesiologist.
   b. Makes sure that patient and anyone to remain in room is shielded.
   c. If patient has had prior myelography, performer may have residual contrast media eliminated by having table tilted.

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- d. Indicates requirements for seriography. If a bi-plane study is involved, orders projections and angulation. Selects timing and simultaneous or sequential filming. Has equipment checked.

7. Performer orders scout films as appropriate for single or bi-plane views. Examines as soon as they are processed:

    - a. Performer considers whether the area to be studied is visible, whether the technique is satisfactory, whether the position(s) of the patient are correct, and whether the view(s) needed are obscured.
    - b. If the scouts are not satisfactory, performer indicates the needed changes in technique or in the patient's position to the radiologic technologist.
    - c. Performer may examine the scout films to note any areas of possible complication.
    - d. Makes final decisions about the spinal cord segments to be visualized.

8. Performer makes final decisions on entry site and technique, based on review of requisition sheet, scouts and own examination of patient.

    - a. Performer chooses right or left femoral artery.
    - b. Decides on type of aqueous iodine based contrast solution and has syringe prepared.
    - c. Specifies sizes and types of guide wires and catheters and local anesthetic to be prepared.
    - d. Performer reviews program for seriography. Indicates to technologist the number of films to be taken, the per-second intervals, and the number of series anticipated, single or biplane. Has technical factors set for seriography and fluoroscopy. If subtraction will be ordered, indicates what views should be filmed prior to injection of contrast.

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- e. Performer orders equipment for manual or pump pressure injection.

9. Performer returns to patient in x-ray room when informed that patient and equipment are ready:

    - a. Checks whether patient has been properly shielded and immobilized; checks that the site of the injection has been properly prepared. If not acceptable, indicates the needed adjustments.
    - b. If patient has special equipment such as IV or indwelling catheter, performer makes sure that these are being monitored.
    - c. Checks sterile tray prepared for procedure. Requests any missing objects. Dons protective lead garments and sterile gown and gloves when appropriate. Checks that emergency cart is present.
    - d. If general anesthetic is to be administered, checks with anesthesiologist to be sure that the patient is ready for procedure to begin.
    - e. Performer checks that appropriate catheter sizes are available and preformed if appropriate. Checks guide wires. May bend guide wires personally.
    - f. Performer may prepare or check percutaneous needle to be used with Seldinger technique.
    - g. Checks that pump pressure injector or syringe with contrast medium, and seriographic equipment are functioning. May prepare syringe with local anesthetic if appropriate.

10. Performer prepares the site for injection of the local anesthetic and insertion of the catheter:

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a. Performer chooses femoral entry site which will allow for later compression of the vessal proximal to the puncture site.
b. Swabs site of entry with prepared antiseptic solution. Covers surrounding areas with sterile towels,leaving only small area for injection and puncture uncovered.
c. Checks amount of local anesthetic to be injected as shown by nurse in syringe or draws anesthetic into sterile syringe. Expels air and inserts needle. Injects anesthetic intradermally and subcutaneously. Removes needle; swabs site with sterile solution. Waits for area to become anesthetized.
d. If patient is conscious, explains when patient is to hold steady for puncture.
e. Performer feels for the femoral arterial pulse by palpating with fingers. Makes an incision or nick through the skin with a sterile scalpel at the site where the catheter will enter.
f. Performer inserts puncture needle tip (of appropriately sized hollow needle with sharp cutting inner stylus) into puncture hole while palpating and fixing the artery. Performer angles needle to enter along the lateral side of the vessel with the tip directed towards the vessel of interest to be catheterized.
g. Performer pulls out the needle's inner stylus and checks that the vessel has been entered without puncturing the opposite wall. Notes whether there is a vigorous jet of arterial blood. May pull back on needle, reinsert, or make other incisions until artery is successfully entered.
h. Performer inserts a guide wire into the needle and advances this into the vessel. May preshape wire if not already done.
i. Once the guide wire is inserted, performer withdraws the hollow needle, compressing the artery to reduce the bleeding. Inserts the appropriate size catheter into the incision and over the guide wire. Removes guide wire.
j. Performer positions the overhead fluoroscope unit over the patient; may have lights in room dimmed; activates the fluoroscope; adjusts technical factors or has this done.
k. Performer advances the catheter, viewing on the TV monitor until the catheter is at the desired level (depending on the vessels selected for study).

11. Performer prepares for multiple injections in the cervical region, the intercostal, lumbar or vertebral arteries as determined:

a. For the cervical region,performer passes catheter into the left or right subclavian artery, advancing the catheter under fluoroscopic control.
b. For selective catheterization of the intercostal artery, performer advances the catheter under fluoroscopic control. Feels for the projection of the intercostal ostium while manipulating the catheter tip into the ostium
c. For catheterization of the lumbar arteries, performer advances the catheter to the lumbar ostium as described above.

12. Performer tests for the appropriate placement of the catheter:

a. Performer has a syringe prepared with a small amount of the contrast solution. Checks that medium is ap-

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List Elements Fully

propriate. Connects syringe to the catheter, and injects a small amount of the solution into the artery for viewing location of catheter tip.

b. Activates fluoroscope and views contrast medium as it flows out of catheter tip. Performer notes the structures detailed by the contrast. Performer judges whether catheter is correctly inserted in vessel. Readjusts or reinserts, checking on fluoroscope monitor until this is accomplished.

c. If performer judges that entry through site chosen cannot be properly accomplished, performer may decide to enter from the opposite artery if appropriate. If so, performer repeats appropriate steps for new location.

d. If entry cannot be easily accomplished, performer may decide to terminate so as to avoid further trauma to vessels. If so, performer records as appropriate and informs staff.

13. Performer flushes periodically with saline solution; may decide to inject a vasodilator; may decide to flush with an anticoagulant:

a. Performer has syringe(s) prepared as described and checks contents.

b. Attaches syringe(s) to catheter and flushes periodically as decided.

14. Once the performer decides that the catheter tip has been correctly placed, performer checks that materials are ready for pressure injection of the contrast solution, and for serial filming. Checks that patient is properly immobilized.

a. If pressure injection is to be done by hand, performer prepares or

List Elements Fully

checks syringe with the iodine based, aqueous contrast solution for correct quantity, depending on vessels to be opacified. Uses the minimum amount necessary.

b. If pressure injection is to be done by automatic injector, performer prepares to coordinate injections with filming:

   i) Checks that the automatic injection (used for introduction of the contrast solution under pressure) is loaded with proper minimum amount of medium in syringe; checks that syringe is attached to injector tubing. Attaches tubing to catheter. Checks that there is no air in system.

   ii) Performer checks on or orders the rate and pressure setting for the entry force for the automatic injector. Considers the force of entry needed to inject the contrast medium into the vessel given the technique, vessel, and other conditions involved.

c. Performer has overhead x-ray tube(s) positioned for serial filming; checks with the technologist the rate of speed and length of time selected. Indicates when to activate the rapid film changer to automatically take the series of radiographs at the pre-programmed rate in relation to the series of injections of the contrast solution and any need for subtraction masks.

d. Checks patient's position. If injecting automatically, performer enters control room. Has patient hold steady if conscious.

e. If performer injects the contrast solution by hand, does so in predetermined amounts spaced periodically as decided; tells technologist

TASK DESCRIPTION SHEET (continued)

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List Elements Fully

when to activate the automatic film changer.

f. With automatic injection, performer tells technologist when to start the automatic film changer(s) (to make sure of proper functioning) to take the series of pre-programmed radiographs. Once changer has started, performer activates the automatic injector allowing for pre-injection views for subtraction masks.

g. Repeats appropriate steps for additional views and patient positions.

15. While serial films are being processed, performer examines and talks to patient (if conscious) to evaluate how the patient has responded to the procedures and the injection. Detaches injector tubing; reflushes incision. Performer may withdraw the catheter from the ostium or subclavian artery and allow it to lie relaxed in the aorta.

16. Throughout procedure performer evaluates how the patient is responding. May decide to provide emergency care.

a. For paraplegia may perform a spinal puncture and withdraw cerebrospinal fluid in small increments to replace the fluid with normal saline. Has patient's head held high to facilitate drainage and removal until the normal iodine level in the cerebrospinal fluid is restored.

b. May administer Valium in solution through the injection catheter.

c. May administer IV infusion; may order and administer a corticosteroid, an antihistamine or atropine.

d. Performer decides whether the reaction is sufficiently controlled to proceed.

e. If performer decides to terminate procedure, notifies appropriate medical staff; orders aftercare as

List Elements Fully

appropriate; has patient transported to appropriate location.

f. Records patient's reactions and what was done on patient's chart. If appropriate, makes sure patient is informed of the type of drug that caused the reaction or explains to patient that he or she is allergic to the contrast solution (i.e. iodine-based solution).

17. Performer looks at the first series of arteriograms on view boxes in sequence as soon as they are processed:

a. Determines whether the spinal arteriograms adequately demonstrate the vessels and structures being studied, the number and location of the feeders, the extent and location of any arteriovenus malformation, the presence of aneurysms, and other signs of abnormal structure or pathology. May ask opinion of another radiologist.

b. Performer decides whether to instill additional contrast or order a change in technical factors. If so, repeats appropriate steps after indicating what is needed to technologist and evaluating patient's condition. Discusses with anesthesiologist if one is present. Reviews additional films as above.

c. If additional arteries are to be opacified, such as the other intercostal or lumbar arteries, or if the other side is to be opacified, such as the opposite subclavian artery, performer decides what will be done at once and whether the other side or additional arteries are to be examined at a second session after several days. Performer considers the pa-

TASK DESCRIPTION SHEET (continued)

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List Elements Fully

tient's condition, the amount of contrast already injected and the urgency of the situation.

18. If the performer is to catheterize a series of arteries, performer reintroduces the guide wire into the catheter:

    a. Under fluoroscopic control, the performer sequentially withdraws and reinserts the catheter as appropriate to reach the arteries of interest under fluoroscopic control:
        i) For ileo-lumbar and lateral sacral arteries, withdraws catheter into the internal iliac artery, crosses the bifurcation of the aorta, and passes the catheter down the common iliac artery.
        ii) For the right subclavian artery, (after catheter is withdrawn into aorta) introduces catheter led by guide wire through the inominate artery into the right subclavian artery.
        iii) Repeats as appropriate for the cervical, intercostal or lumbar feeding arteries as decided.
    b. For each branch being opacified, performer sequentially places catheter, injects contrast, takes serial films, flushes to prevent clot formation, and withdraws catheter from the ostium as described above.
    c. If the performer requires views of the anterior and posterior spinal veins and radicular veins, performer orders serial films at appropriate time as contrast follows its normal circulatory route.
    d. Performer may order delayed films of the urinary tract allowing for normal excretion timing.
    e. For all filming performer indicates to technologist what is required. Reviews processed films as described above and checks patient's condition before proceeding each time.

List Elements Fully

19. Performer decides when the radiographic examination is completed based on information on the angiograms and the patient's condition. Informs anesthesiologist (if present) and technologist that procedure is completed.

20. Performer returns to the patient. If patient is conscious, performer reassures and explains what will happen next.

    a. Removes any tourniquets; removes any connecting tubes or syringes from catheter. Makes sure not to disturb any IV infusion or indwelling catheter.
    b. Performer gently and slowly withdraws the catheter, manipulating by turning and pulling, taking care not to injure the vessel or enlarge the wound at the entry point.
    c. Performer compresses the vessel proximal to the puncture site with the fingertips or sterile gauze for an appropriate amount of time to stop the bleeding and avoid hematoma. Performer then has a pressure dressing applied and orders bed rest for the patient after recovery of pharyngolaryngeal reflex.
    d. Performer may order medication, an IV infusion, and careful observation of patient including vital signs, urinary output, and skin care. May order tests.
    e. Has appropriate sanitary clean up procedures carried out. May fill out order forms for medications, tests, delayed films, or completion of study at a later time.

TASK DESCRIPTION SHEET (continued)

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List Elements Fully	List Elements Fully
21. Performer records impressions of procedure on patient's chart: a. Preliminary findings. b. How patient tolerated procedure. c. Any special nursing follow-up recommended, tests ordered, records and observation required, medication, delayed films, later studies ordered. d. May sign chart, requisition sheet or order forms.	

TASK DESCRIPTION SHEET

Task Code No. 430

This is page 1 of 6 for this task.

1. What is the output of this task? (Be sure this is broad enough to be repeatable.)

Decisions made on whether to go ahead, on technique, on entry site; pt.reassured;local anesthetic injected;spinal tap needle inserted;spinal fluid removed; contrast medium injected into spinal canal,directed to areas of interest under fluoroscopic control;spot films taken;complete set of posterior fossa myelograms approved;contrast medium removed;medical impressions,follow-up recommendations recorded;posterior fossa lesions or tumors reported.

2. What is used in performing this task? (Note if only certain items must be used. If there is choice, include everything or the kinds of things chosen among.)

X-ray requisition form,pt.'s chart,prior radiographs; pen;view boxes;sterile tray with drape,vena tube,antiseptic,sterile solutions,swabs,syringes,needles, local anesthetic,spinal tap needle,gauze,bandage, tubing,specimen bottle,labels,iodized oil contrast; fluoroscope,tilt table,spot film device,monitor;sterile gown,gloves;marking pencil;lead garments;receptacle;emergency cart;restraining devices;shielding

3. Is there a recipient, respondent or co-worker involved in the task? Yes...(X) No...( )

4. If "Yes" to q. 3: Name the kind of recipient, respondent or co-worker involved, with descriptions to indicate the relevant condition; include the kind with whom the performer is not allowed to deal if relevant to knowledge requirements or legal restrictions.

Any pt.to have posterior fossa myelography; accompanying adult; radiologist; clinician; neurosurgeon; radiologic technologist; nurse; anesthesiologist

5. Name the task so that the answers to questions 1-4 are reflected. Underline essential words.

Conducting positive contrast posterior fossa myelography of any pt. by deciding whether to go ahead, and on technique based on review of condition and examination;reassuring;injecting local anesthetic; inserting spinal tap needle under fluoroscopic control; removing spinal fluid;injecting iodized oil contrast; directing flow to craniospinal,posterior fossa areas of interest by using tilt table and fluoroscopic control;taking spot films; viewing and approving myelograms;removing contrast medium;recording medical impressions and needed nursing follow-up;notifying surgeon of obstructing lesions or tumors.

List Elements Fully

Performer receives the x-ray requisition form and medical chart of a patient scheduled for posterior fossa positive contrast myelography (study of the structures around the foramen magnum and in the posterior fossa, such as the cerebellopontine angle cisterns, after instillation of an iodized oil contrast medium).

1. Performer reads the patient's requisition form and relevant information to become familiar with the case or to review materials seen earlier.

    a. Notes patient's age and sex; reviews test results and interpretation of plain radiographs, cerebral angiograms (taken prior to this examination)to become familiar with diagnostic information and the nature of the pathology suspected (usually lesions of the craniospinal junction, cerebellopontine angle cisterns and acoustic neurinoma or neurilemoma). Notes history of symptoms. Views radiographs on view boxes.

    b. Notes any other medically relevant information such as history of adverse reaction to iodized oil contrast material, whether female patient is pregnant, whether patient has an infectious or communicable condition. May call clinician to obtain additional information.

OK-RP;RR;RR

6. Check here if this is a master sheet..(X)

TASK DESCRIPTION SHEET (continued)

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This is page 2 of 6 for this task.

List Elements Fully

c. Notes the regions to be visualized, recommendations on technique and site of spinal puncture. Notes whether general anesthesia has been ordered (for pediatric patient).
d. Checks to see that patient or authorized adult has signed consent for procedure. If not, informs appropriate co-worker and either has examination delayed until written consent is obtained or arranges to obtain personally before sedation.

2. Performer greets non-infant patient and any accompanying adult in examination room. Attempts to reassure; explains what will be done.

   a. May question about patient's symptoms in relation to the condition being studied. May collect additional medical history such as previous radiography, allergies.
   b. Determines whether female patient of childbearing age may be pregnant.
   c. Performer examines the patient for neurological symptoms and to assess appropriate site for spinal puncture.
   d. Performer may explain or demonstrate use of equipment to a child to allay fears and enlist cooperation; answers questions. Explains that patient will be asked to hold still from time to time. Indicates how the padded shoulder braces and restraints will be used to hold patient in head-down positions from time to time. Demonstrates how the head will be manipulated and stresses need to maintain positions.
   e. If appropriate, performer may describe the procedure and its risks and obtain consent signature from patient or authorized adult. (Does not proceed without signed consent.)

List Elements Fully

3. Performer notes whether there are contraindications to going ahead with the procedure such as elevated intracranial pressure, acute inflamation of the central nervous system, based on medical records and clinical evidence. May call clinician or neurologist and discuss patient's current condition and any alternative steps.

4. If performer decides not to proceed, records reasons and any recommendations on patient's chart. Informs appropriate co-worker of cancellation and has patient returned to room. If appropriate, orders rescheduling of patient or scheduling for alternative procedure.

5. If performer decides to proceed, may order scout film; reads on view box as soon as processed. Determines whether the patient's position and technical factors are adequate to provide diagnostic information. Indicates to technologist any needed adjustments in technique or positioning.

6. With pediatric patient performer may consider whether general anesthesia (if suggested) is still warranted; may decide to order if patient's behavior and condition suggest the need. If general anesthesia is to be carried out, performer discusses with anesthesiologist when it is to be performed and awaits indications from anesthesiologist as to when to proceed.

7. Performer makes final decision on entry site and technique, based on review of requisition sheet, own examination of patient and scout film.

   a. Selects iodized oil contrast medium and estimates amount required based on the patient's size. May have contrast heated to room temperature.

TASK DESCRIPTION SHEET (continued)

Task Code No. 430

This is page 3 of 6 for this task.

List Elements Fully

- b. Orders appropriate size puncture needle.
- c. Informs appropriate co-workers of decisions so that patient and materials can be prepared.
- d. Has technical factors set for fluoroscopy. If the spot film attachment uses cassettes, performer has cassette inserted. Chooses full, half or quarter format and sets as appropriate. (If roll film attachment, checks that attachment is loaded with film or has this done.)
- e. Performer dons protective lead garments and sterile gown and gloves when appropriate.

8. When informed that patient and equipment are ready, performer checks whether patient has been properly immobilized and prepared for the puncture on tilt table:

   - a. Checks that all materials needed and emergency cart are present, that correct drugs and sizes of items are present. Checks appearance of contrast medium to be sure there is no chemical deterioration.
   - b. Checks that patient and others in the room have been properly shielded. May decide to immobilize patient personally.
   - c. Performer has any needed changes or adjustments made.

9. Performer prepares for the spinal puncture:

   - a. With patient in appropriate position, performer chooses and marks off the appropriate spinal area selected for the puncture with a marking pencil.
   - b. Swabs area with prepared antiseptic solution. Wipes off excess. Covers surrounding areas with sterile drape.

List Elements Fully

   - c. Performer checks amount of local anesthetic in sterile syringe or draws up personally in amount required. Expels air in syringe. Inserts needle into area intradermally and subcutaneously. Injects anesthetic. Removes needle and waits for area to become anesthetized.
   - d. Performer prepares spinal tap needle by assembling as appropriate. Fills a sterile syringe with iodized oil contrast medium. Checks quantity. Lays assembled needle and syringe on sterile tray.
   - e. Performer positions fluoroscope unit over entry site. May have lights in room dimmed. Activates fluoroscope and has technical factors and unit position adjusted until area of interest is optimally visible on TV monitor. Shuts fluoroscope.

10. The performer positions the spinal tap needle at the exact site of entry at the appropriate angle. Has patient hold still while performer inserts needle. Checks for a characteristic "give" as the dura is passed.

   - a. Performer negotiates the subarachnoid space until the needle is deemed properly located.
   - b. Checks needle placement on TV monitor and adjusts as deemed necessary.
   - c. Withdraws inner part of needle and checks for egress of spinal fluid. May repeat procedure until proper entry is accomplished. Shuts fluoroscope. Wipes away blood and fluid.

11. Performer attaches a sterile rubber tube extension to the protruding end of the spinal needle. Removes spinal fluid in amount proportionate to the

TASK DESCRIPTION SHEET (continued)

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contrast to be injected by attaching a sterile syringe to the rubber tube extension. Allows gravity to draw out the fluid. May eject fluid into sterile container, note amount and condition of fluid,and have nurse close and label container.

12. Performer adjusts table to horizontal position. Inserts syringe with contrast medium into spinal tap needle and injects a small trial amount of contrast medium into spinal canal. Activates fluoroscope and observes the contrast medium within the spinal canal to make sure the medium can be controlled and will enter the areas of interest.

13. When satisfied that needle position is appropriate, performer removes syringe and closes off spinal tap needle (using adjustable cap) to prevent seepage. Has patient securely positioned and restrained for instillation of the contrast medium into the subarachnoid space in the spinal canal.

14. With patient in prone position,performer again attaches syringe with contrast medium to the spinal tap needle.

    a. While observing on TV monitor, performer injects the contrast into the subarachnoid space using appropriate pressure.
    b. Performer observes the filling of the space and judges when enough contrast has been instilled to provide a full column of medium to extend from the posterior fossa down to the upper cervical region. Manipulates tilt table and gravity to achieve this after instillation.
    c. When performer has injected sufficient contrast, closes off puncture needle and covers with radiolucent protective bandage.

List Elements Fully

15. Performer then moves tilt table under fluoroscopic control so that the contrast material is guided into the posterior fossa.

    a. Performer turns the patient's head as appropriate and fixes the head so that it is hyperextended. Makes sure that patient will not or cannot turn head except as done by performer.
    b. May have patient placed faced down and firmly secured, or does so personally. Reassures patient.
    c. Performer is careful to prevent the column of oil from entering the tentorial notch and middle fossa. Keeps head hyperextended.
    d. Performer adjusts tilt table alternately from head-down inclinations to the horizontal until the contrast has entered the areas of interest such as one of the cerebellopontine angles. Turns patient's head as appropriate for examination of the first side.

16. As the areas of interest are filled and visualized, performer decides what to record with spot films while viewing on monitor:

    a. Takes anteroposterior and lateral films each time the position of the head and the medium is altered. Makes sure to check for filling of the internal auditory canal or notes whether it cannot be filled.
    b. Activates spot film attachment and x-ray button as appropriate. If cassette attachment, may have technologist remove cassette as spots are snapped and insert additional cassettes, or performer does so personally.

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List Elements Fully

List Elements Fully

c. Throughout procedure performer remains alert for symptoms of adverse reaction to procedure. Performer may decide to provide emergency care.

17. Performer reverses and repeats procedures as appropriate to fill, visualize, and spot film the structures on the other side of the head:

    a. Performer returns the contrast material to the cervical spinal canal, and then repeats the filling procedure for the other side; takes spot films as appropriate.
    b. Performer may accomplish the refilling by having patient's head raised, having patient inhale at given intervals before reversing sides.
    c. Performer may decide to fill the fourth ventricle. If so, has patient's position adjusted appropriately to accomplish this, but makes sure that head is held at all times to prevent it from assuming a dependent position. After patient is positioned with head flexed, performer tilts the table head downward, observes the filling of the fourth ventricle (if it can be filled), and takes appropriate spot films if there is visualization.

18. Performer decides when adequate spot filming is completed. Has spot films processed at once. May have table tilted head upward to 45° to prepare for removal of the medium.

19. Performer looks at the myelograms on view boxes when they are brought or goes to automatic processor to read them:

    a. Checks for technical quality and notes whether any irregularities are due to artifacts or actual pathological or abnormal conditions, and whether the views are clear enough for interpretation.
    b. Determines whether the films adequately demonstrate the areas being examined and provide enough information to make possible competent medical interpretations. Performer may ask opinion of another radiologist or surgeon.
    c. Decides whether it would be desirable to redo any portion of the procedure, including injection of additional contrast medium or taking views at additional angles. If so, examines patient's condition and decides whether redoing any portion of the procedure is compatible with the patient's condition and radiologic history.
    d. If decision is to repeat any portion, proceeds as in appropriate earlier steps until performer decides that an adequate set of films has been produced.
    e. If performer observes an obstructing lesion or tumor in the posterior fossa, may mark patient's skin at the appropriate level, notify surgeon at once and discuss before deciding to remove the contrast material.

20. Performer prepares for removal of the contrast medium from the spinal canal by turning the table to 45°.

    a. Removes protective bandage. Attaches empty syringe to spinal needle and activates the fluoroscope. Checks that the column of contrast has pooled at the puncture site.
    b. Performer increases inclination of table and pulls back on the syringe plunger so that the contrast medium (heavier than the spinal fluid) will drain out by gravity and suction. Performer notes prog-

TASK DESCRIPTION SHEET (continued)

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List Elements Fully

ress by looking at the image of the medium on the TV monitor.

c. If blockage occurs which prevents the free passage of the medium out of the canal, performer may decide to do any or all of the following, usually in the following order as needed:
   - i) Performer uses fluoroscope to determine the location of the blockage. May ask the advice of other physicians.
   - ii) Performer may decide to use suction method. Attaches an additional (vena) tube to the syringe attached to the spinal tap needle, and uses the syringe plunger to obtain a greater suction effect on the medium to draw it out of the canal.
   - iii) Performer may decide, after viewing on TV monitor and/or consultation, that the remaining amount of contrast medium is not intolerable and is less dangerous than further removal efforts.
   - iv) Performer may decide to effect removal via a new puncture above or below the point of blockage. Chooses the new space between two vertebrae and repeats appropriate steps as described above to insert needle at new site. Allows contrast medium to pass into a receiving cup via a tube connected to the syringe attached to needle.
   - v) May order overhead radiograph to demonstrate extent of removal.

21. When performer decides that the contrast medium has been satisfactorily removed, shuts fluoroscope. Informs staff and anesthesiologist (if present) that examination is completed.

List Elements Fully

a. Performer reassures patient. Gently removes the spinal tap needle; swabs area.
b. Asks nurse to dress and bandage puncture site, specifying what to use. Has appropriate, sanitary clean up procedures carried out.

22. Performer records impressions of procedure on patient's chart:

a. Preliminary findings.
b. How patient tolerated procedure.
c. Any special nursing follow-up recommended.
d. May sign chart or requisition sheet.

TASK DESCRIPTION SHEET

Task Code No. 431

This is page 1 of 4 for this task.

1. What is the output of this task? (Be sure this is broad enough to be repeatable.)

Decisions made on whether to go ahead with discography and on technique, entry site; patient reassured; local anesthetic injected; spinal tap needle inserted; contrast medium injected through first needle with second needle; placement and filling checked with fluoroscopy; discograms ordered; complete set of discograms approved; medical impressions, needed follow-up care recorded.

2. What is used in performing this task? (Note if only certain items must be used. If there is choice, include everything or the kinds of things chosen among.)

X-ray requisition form,pt.'s chart,prior radiographs; view boxes;sterile tray with antiseptic solution, swabs,local anesthetic,dressings,iodine based contrast solution,drape,puncture needles,gauze,syringes; emergency cart and materials;protective lead garments;sterile gown,gloves;immobilization devices; shielding;fluoroscope and TV monitor:tilt table,marking pencil;telephone;pen;traction devices

3. Is there a recipient, respondent or co-worker involved in the task? Yes...(X) No...( )

4. If "Yes" to q. 3: Name the kind of recipient, respondent or co-worker involved, with descriptions to indicate the relevant condition; include the kind with whom the performer is not allowed to deal if relevant to knowledge requirements or legal restrictions.

Any patient to have discography;accompanying adult; radiologist;clinician;orthopedist;radiologic technologist; nurse; anesthesiologist

5. Name the task so that the answers to questions 1-4 are reflected. Underline essential words.

Conducting discography of any patient by deciding whether to go ahead, on technique and entry site based on review of current condition,examination and scout films;reassuring pt.;injecting local anesthetic;inserting spinal tap needle under fluoroscopic control;injecting aqueous iodine based contrast into disc by syringe and a second needle,through puncture needle,under fluoroscopic control;ordering discography;deciding when examination is completed by viewing discograms;recording medical impressions and needed nursing follow-up.

List Elements Fully

Performer receives the x-ray requisition form and medical chart of a patient scheduled for discography (study of intervertebral disc after instillation of a contrast medium into the disc).

1. Performer reads the patient's requisition form and relevant information to become familiar with the case or to review materials seen earlier.
   a. Notes patient's age and sex; reviews interpretation of plain radiographs or myelograms taken prior to this examination to become familiar with location and nature of the pathology suspected (usually herniated intervertebral disc). Notes whether there are acute injuries to the spine, whether patient is in traction. Views radiographs on view boxes.
   b. Notes any other medically relevant information such as history of adverse reaction to aqueous iodine-based contrast material, whether female patient is pregnant, whether patient has an infectious or communicable condition. May call clinician to obtain additional information.
   c. Notes any recommendations made on technique and site of disc puncture. Notes whether general anesthesia has been ordered (for pediatric patient).

OK-RP;RR;RR

6. Check here if this is a master sheet..(X)

TASK DESCRIPTION SHEET (continued)

Task Code No. 431

This is page 2 of 4 for this task.

List Elements Fully

d. Checks to see that patient or authorized adult has signed consent for procedure. If not, informs appropriate co-worker and either has examination delayed until written consent is obtained or arranges to obtain personally before sedation.

2. Performer greets patient and any accompanying adult in examination room. Attempts to reassure; explains what will be done.

   a. May question about patient's symptoms in relation to the condition being studied. May collect additional medical history such as previous radiography, allergies.
   b. Determines whether female patient of childbearing age may be pregnant.
   c. Performer examines the patient. May palpate spinal area to feel location of fracture, dislocation, or mass. May check that traction is being properly maintained if appropriate.
   d. Performer may explain or demonstrate use of equipment to a child to allay fears and enlist cooperation; answers questions. Explains that patient will be asked to hold still from time to time.
   e. If appropriate, performer may describe the procedure and its risks and obtain consent signature from patient or authorized adult. (Does not proceed without signed consent.)

3. Performer notes whether there are contraindications to going ahead with the procedure based on assessment of patient's current condition. May have clinician or orthopedist called; discusses patient's current condition and any alternative steps.

4. If performer decides not to proceed, records reasons and any recommendations on patient's chart. Informs appropriate co-worker of cancellation and has patient returned to room. If appropriate, orders rescheduling of patient or scheduling for alternative procedure.

List Elements Fully

5. If performer decides to proceed, may order scout film; reads on view box as soon as processed:

   a. Determines whether the patient's position and technical factors are adequate to provide diagnostic information. Indicates to technologist any needed adjustments in technique or positioning.
   b. Evaluates information on scout film to determine the entry point for the puncture and the interspaces to be opacified.

6. With pediatric patient performer may consider whether general anesthesia (if suggested) is still warranted; may decide to order if patient's behavior and condition suggest the need. If general anesthesia is to be carried out, performer discusses with anesthesiologist when it is to be performed and awaits indications from anesthesiologist as to when to proceed.

7. If performer decides to proceed, performer makes final decision on entry site and technique, based on review of requisition sheet and own examination of patient and scout film. Selects contrast medium and estimates amount required based on the size of the area and the nature of the pathology suspected. Orders puncture needle sizes as appropriate. Informs appropriate co-workers of decisions so patient and materials can be prepared. Has technical factors set for fluoroscopy.

8. When informed that patient and equipment are ready, performer checks

TASK DESCRIPTION SHEET (continued)

Task Code No. 431

This is page 3 of 4 for this task.

List Elements Fully

whether patient has been properly immobilized and prepared for the disc puncture:

- a. Checks that all materials needed and emergency cart are present, that correct drugs and sizes of items are present.
- b. Checks that patient and others in the room have been properly shielded. May decide to immobilize patient.
- c. Performer has any needed changes or adjustments made.
- d. Performer dons protective lead garments and sterile gown and gloves when appropriate.

9. Performer prepares for the disc puncture:

- a. With patient in appropriate position, performer chooses and marks off the area selected for the disc puncture with a marking pencil.
- b. Swabs area with prepared antiseptic solution. Wipes off excess. Covers surrounding areas with sterile drape.
- c. Performer checks amount of local anesthetic in sterile syringe or draws up personally in amount required. Expels air in syringe. Inserts needle into area intradermally and subcutaneously. Injects anesthetic. Removes needle and waits for area to become anesthetized.
- d. Performer prepares spinal tap needle by assembling as appropriate. Fills a sterile syringe with aqueous iodine-based contrast solution. Checks quantity and prepares a second injection needle. Lays assembled needles and syringe on sterile tray.
- e. Performer positions fluoroscope unit over entry site. May have lights in room dimmed. Activates fluoroscope and has technical factors and unit position adjusted until area of interest is optimally visible on TV monitor. Shuts fluoroscope.

List Elements Fully

10. The performer positions the spinal tap needle at the exact site of entry over the disc to be entered at the appropriate angle. Has patient hold still while performer inserts needle. Checks for a characteristic "give" as the dura is passed.

- a. Performer negotiates the subarachnoid space until the needle is deemed properly located.
- b. Checks needle placement on TV monitor and adjusts as deemed necessary.
- c. Withdraws inner part of needle and checks for egress of spinal fluid. May repeat procedure until proper entry is accomplished. Shuts fluoroscope. Wipes away blood and fluid.

11. Performer uses second needle to instill the contrast solution under fluoroscopic control:

- a. Performer passes the second needle through the hollow needle(already inserted into the spinal canal)and into the center of the disc.
- b. Checks the needle position on the TV monitor. Adjusts as needed.
- c. When satisfied that the second needle is in position, performer attaches the syringe with the contrast material.
- d. While observing on TV monitor, performer injects contrast into the disc using appropriate pressure.
- e. Performer observes the filling of the disc; notes whether the medium breaks out of the confines of the interspace; observes the appearance of blockages or protrusions.
- f. Throughout procedure performer remains alert for symptoms of adverse reaction to procedure. Performer may decide to provide emer-

TASK DESCRIPTION SHEET (continued)

Task Code No. 431

This is page 4 of 4 for this task.

List Elements Fully

gency care. May terminate instillation if pain is severe.

12. The performer decides when the instillation of the contrast is completed. Shuts fluoroscope. Tells technologist what radiographs to take. Decides on and indicates what views are to be taken such as lateral, anteroposterior, oblique. Removes inner needle and closes off puncture needle. May apply protective bandage.

13. Performer looks at discograms on view boxes as soon as they are processed:

    a. Performer checks for technical quality and notes whether any irregularities are due to artifacts or actual pathological or abnormal conditions, and whether the views are clear enough for interpretation.
    b. Determines whether the films adequately demonstrate the area being examined and provide enough information to make possible a competent medical interpretation. Performer may ask opinion of clinician or another radiologist.
    c. Decides whether it would be desirable to redo any portion of the procedure, including injection of additional contrast medium, views at additional angles, or changes of technical factors. If so, examines patient's condition and decides whether redoing the portion of the procedure is compatible with the patient's condition and radiologic history. Informs technologist of any needed changes in technical factors or positioning for repeat radiography, and orders for additional views.
    d. If decision is to repeat any portion, repeats appropriate steps until performer decides that an adequate set of films has been produced.

List Elements Fully

    e. May decide to order delayed films. If so, records as appropriate.

14. When the performer decides that the examination has been completed, informs staff and anesthesiologist, if present.

    a. Performer returns to the patient and reassures. Removes protective bandage. Gently removes the spinal tap needle; swabs area.
    b. Asks nurse to dress and bandage puncture site, specifying what to use. Has appropriate, sanitary clean up procedures carried out.

15. Performer records impressions of procedure on patient's chart:

    a. Preliminary findings.
    b. How patient tolerated procedure.
    c. Any special nursing follow-up recommended, delayed films ordered.
    d. May sign chart or requisition sheet.

TASK DESCRIPTION SHEET

Task Code No. 432

This is page 1 of 2 for this task.

1. What is the output of this task? (Be sure this is broad enough to be repeatable.)

Decision on whether to go ahead with skull tomography; "cuts" for tomograms specified (the depth, level and intervening distances); complete set of skull tomograms ordered and approved; medical impressions and recommendations recorded.

2. What is used in performing this task? (Note if only certain items must be used. If there is choice, include everything or the kinds of things chosen among.)

X-ray requisition form and patient's chart; skull tomogram scout films; view boxes; emergency cart; telephone; pen; shielding; immobilization devices

3. Is there a recipient, respondent or co-worker involved in the task? Yes...(X) No...( )

4. If "Yes" to q. 3: Name the kind of recipient, respondent or co-worker involved, with descriptions to indicate the relevant condition; include the kind with whom the performer is not allowed to deal if relevant to knowledge requirements or legal restrictions.

Any patient to have skull tomography; radiologist; clinician; neurologist; radiologic technologist;nurse;clerk;anesthesiologist

5. Name the task so that the answers to questions 1-4 are reflected. Underline essential words.

Directing skull tomography of any patient by deciding whether to proceed; reassuring; reviewing preliminary films; selecting positions, levels, number and distances of tomogram "cuts"; reviewing tomograms and continuing as appropriate; deciding when examination is completed; recording medical impressions and needed nursing follow-up.

List Elements Fully

Performer receives the x-ray requisition form and medical information on a patient scheduled for skull tomography (radiographs of selected layers of the skull).

1. Performer reads the patient's requisition form and relevant information to become familiar with the case or to review materials seen earlier.
   a. Notes patient's age and sex; reviews interpretation of radiographs taken prior to this examination to become familiar with location and nature of the pathology suspected.
   b. Notes recommendations on number and depth of cuts for tomograms, comments by neurologist, description of how patient tolerated previous procedures, and any other medically relevant information. Performer examines patient's radiographs on view boxes.
   c. With pediatric patient notes whether general anesthesia has been suggested.
   d. Notes collateral conditions such as presence of infection or communicable disease.
   e. Determines whether female patient of childbearing age may be pregnant.
2. Performer notes whether there are contraindications to going ahead with the skull tomography. May have clinician or

OK-RP;RR;RR

6. Check here if this is a master sheet..(X)

TASK DESCRIPTION SHEET (continued)

Task Code No. 432

This is page 2 of 2 for this task.

List Elements Fully

neurologist called; discusses patient's current condition and any alternative steps. Decides whether to proceed or not based on assessment of patient's current condition and contraindications.

a. If performer decides not to proceed, records reasons and any recommendations on patient's chart. Informs appropriate co-worker of cancellation and has patient returned to room. If appropriate, orders rescheduling of patient or scheduling for alternative procedure.
b. If performer decides to go ahead, performer orders scout films. Estimates the probable depth and level of the mass to be studied based on recommendations on requisition sheet and own examination. Indicates positions, levels, amplitude and number to technologist.

3. Performer views the scout tomograms on view boxes as they are processed. Performer judges whether the pathology has been localized visually. Performer then selects the level, number and intervening distances at which the "cuts" should be made with the patient in appropriate positions.

4. With pediatric patient performer may consider whether general anesthesia (if suggested) is still warranted; may decide to order if patient's behavior and condition suggest the need. If general anesthesia is to be carried out, performer discusses with anesthesiologist when it is to be performed and awaits indications from anesthesiologist as to when to proceed.

5. Performer indicates to radiologic technologist when to take tomograms, and checks final orders for the first set of skull tomograms.

List Elements Fully

6. Performer looks at set of tomograms on view boxes as soon as they are processed. Determines whether the tomograms are technically adequate to demonstrate the area and condition under study and provide adequate information on the nature and position of the pathology. Performer may ask opinion of another radiologist.

a. Performer may decide that a level needs to be further defined. May decide on more cuts at shorter intervening distances for any given level and patient position. May decide to ask for a change in the technical factors to provide a more interpretable image.
b. Performer decides what to order based on information already available, the way in which the patient responded to the procedure, and patient's age and radiographic history.
c. If the performer decides to order additional tomograms and/or a change in the technical factors, informs technologist, specifying what is needed; may record.

7. Performer examines additional tomograms as described above. When performer has determined that the examination has been completed, informs technologist (and anesthesiologist if present) that procedure may be terminated.

8. Records impressions of procedure on patient's chart:

a. Preliminary findings.
b. Any special nursing follow-up recommended.
c. May sign chart or requisition sheet.

TASK DESCRIPTION SHEET

Task Code No. 433

This is page 1 of 5 for this task.

1. What is the output of this task? (Be sure this is broad enough to be repeatable.)

Patient examined and reassured;scout films ordered and assessed;decisions made on whether to go ahead and on technique;salivary gland duct dilated and hollow cannula inserted; contrast medium instilled; overhead films ordered and assessed;decision made on whether to instill in other ducts;complete set of sialograms approved;orders given for delayed films; lemon slices given for removal of contrast;medical impressions,orders for follow up care recorded;MD notified of emergency signs.

2. What is used in performing this task? (Note if only certain items must be used. If there is choice, include everything or the kinds of things chosen among.)

X-ray requisition form;pt's chart,medical records; prior radiographs; view boxes;emergency cart and supplies;sterile gloves,gown;sterile tray with blunt hollow cannulas and tubing,lacrimal probes and graded dilators,syringes,tongue depressors,swabs;iodized oil contrast medium;shielding;headlight or lamp; lemon slices;clamp or hemostat;basin;examination stool or table;order forms;pen;phone

3. Is there a recipient, respondent or co-worker involved in the task? Yes...(X) No...( )

4. If "Yes" to q. 3: Name the kind of recipient, respondent or co-worker involved, with descriptions to indicate the relevant condition; include the kind with whom the performer is not allowed to deal if relevant to knowledge requirements or legal restrictions.

Patient to have sialography;accompanying adult;referring clinician;radiologic technologist

5. Name the task so that the answers to questions 1-4 are reflected. Underline essential words.

Conducting sialography of any patient by deciding whether to go ahead;examining and reassuring pt.; viewing preliminary films,deciding on technique;dilating appropriate salivary ducts;inserting hollow cannula and instilling iodized oil contrast medium; ordering overhead films;viewing sialograms and deciding whether to examine other glands;approving complete set of sialograms;giving lemon slices to remove contrast;ordering delayed films;recording medical impressions and needed follow up; notifying MD of emergency signs.

List Elements Fully

Performer receives the x-ray requisition form and medical information for a patient scheduled for sialography (radiographic contrast study of the salivary glands, ducts and alveoli).

1. Performer reads the patient's requisition form and relevant information to become familiar with the case. Notes patient's age, sex, and any diagnostic information already collected.
   a. Notes whether a bilateral study is indicated or, if unilateral, which side. Notes which glands are involved (parotid or submandibular).
   b. Performer notes the history of the suspected condition,indications of suspected obstruction,stenosis,enlargement,or inflamation. Studies prior plain films or fi[illegible] of prior study on view boxes.
   c. Performer notes any other relevant medical information such as allergy to iodine based substances and conditions which might be contraindications to the procedure. Checks whether patient may have an infectious or communicable condition,whether a female of child-bearing age is pregnant.
   d. Performer checks to see that patient or an authorized adult has signed a consent for the procedure.

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6. Check here if this is a master sheet..(X)

TASK DESCRIPTION SHEET (continued)

Task Code No. 433

This is page 2 of 5 for this task.

List Elements Fully	List Elements Fully
If not, arranges to have this done; has examination delayed until consent is obtained, or decides to obtain personally. e. Performer may call referring physician to discuss case or obtain additional information. 2. Performer greets patient and any accompanying adult in examination room. a. Performer reassures patient and/or adult with patient. Explains what will be done. Indicates what pain may occur. Answers questions. With child, may instruct and rehearse patient in the procedures to be followed so as to obtain patient's cooperation. Asks patient wearing dentures to remove them. b. Performer questions accompanying adult and/or patient about patient's current symptoms in relation to the condition being studied. May collect additional relevant medical history. Determines whether female patient of child bearing age may be pregnant. c. Performer may don sterile gloves and manually examine patient's mouth, palpating to feel the location and extent of any mass or distension involved; notes condition and any symptoms of conditions which contraindicate the procedure. d. If appropriate, performer obtains written consent for procedure from patient or authorized adult. Explains the procedure and the risks involved. (Does not proceed unless there is a signed consent.) 3. Performer orders preliminary films appropriate for the side(s) to be studied and glands involved. May order intraoral occlusal radiography if intragland calcification or duct calculi are suspected. Indicates need for appropriate shielding for patient and anyone remaining in room during exposure.	a. Performer views scout films on view box. Evaluates whether the technical factors and patient positions are appropriate to produce satisfactory radiographs. If not, indicates to technologist what adjustments are needed. b. Performer also notes the appearance of gland enlargement, local bone destruction, and the demonstration of intragland calcification or duct calculi. Estimates the amount of contrast medium that may be required based on the appearance of the glands and the patient's size. 4. Performer considers whether there are contraindications to going ahead with the procedure based on clinical information and evidence of scout films. May discuss patient's current condition and steps to be taken with referring physician. 5. If performer decides not to proceed, records reasons and any recommendations on patient's chart. Informs appropriate co-worker. If appropriate, orders rescheduling of patient or scheduling for alternative procedure. 6. If performer decides to proceed: a. Performer indicates what equipment will be used and the appropriate selections of cannulas, probes and dilators. Orders syringe and iodized oil contrast medium. b. Performer has patient prepared and positioned for instillation of the medium. Has overhead x-ray equipment readied for use immediately after the contrast is instilled. Dons sterile gown and gloves when appropriate. 7. When informed that patient and equipment are ready, performer checks that

TASK DESCRIPTION SHEET (continued)

Task Code No. 433

This is page 3 of 5 for this task.

List Elements Fully

patient and materials have been properly prepared:

- a. Checks that all materials needed are present, that emergency cart is present.
- b. Checks that patient has been properly shielded and positioned on x-ray table or stool.
- c. Has any missing items brought or needed adjustments made.
- d. Performer prepares syringe with iodized oil contrast solution by expelling air and drawing up appropriate amount. Lays syringe on tray.

8. Performer prepares to locate the first ductal opening to be visualized:

- a. Explains to patient how to cooperate by relaxing jaw, positioning tongue, and moving head as requested.
- b. Performer takes a position to provide best access and adjusts headlight or lamp.
- c. Performer may use a lacrimal probe to locate a parotid duct (Stensen's duct) in the vestibule of the mouth on the inner surface of the cheek, or a submandibular duct (Wharton's duct) on the floor of the oral cavity on one side of the lingual frenulum.

  Performer may use tongue depressors, may evert patient's cheek, may instruct patient to raise tongue toward roof of mouth.

- d. If performer has difficulty finding the ductal orifice, may have a few drops of lemon juice placed in patient's mouth to cause salivation so that opening can be seen, or performer may press lightly on gland to cause saliva to flow.

List Elements Fully

9. When performer finds the ductal opening, performer proceeds to dilate the orifice to accommodate a blunt-ended hollow sialography needle (or cannula).

- a. Performer uses a graded series of dilators (such as for lacrimal ducts) by gently introducing dilators of increasing diameter until the opening is adequate for insertion of the needle.
- b. When a dilator of appropriate size has been inserted in the ductal opening, performer prepares the blunt-ended hollow needle (or cannula) with tubing attached by connecting to the prepared syringe with the contrast medium. Performer removes air bubbles.
- c. Performer has technologist hold syringe end while performer gently removes the dilator and inserts the cannula into the duct opening. Performer inserts a distance of 0.5 to 2cm. until the cannula is gripped firmly by the periductal soft tissues.
- d. Performer has the patient close his or her lips to stabilize the cannula and tube.
- e. Performer positions patient for first radiographic exposure and uses this position for instillation of the contrast medium so that little additional positioning will be needed for radiography.

10. Performer explains to patient that the instillation of the contrast medium may be painful and will involve a feeling of distension. Asks patient to cooperate as appropriate and to bear with the pain if possible.

TASK DESCRIPTION SHEET (continued)

Task Code No. 433

This is page 4 of 5 for this task.

List Elements Fully

a. Performer slowly injects the contrast medium under moderate pressure while noting the appearance of the gland. Unless the gland was already distended, performer judges when appropriate contrast has been injected by observing the swelling. Performer may stop injection when patient feels discomfort.
b. Throughout procedure performer remains alert to the patient's condition and notes any signs of adverse reaction to the procedure or contrast medium. May decide to provide emergency care.
c. When the performer judges that the gland has been filled, performer attaches (clips with hemostat) the syringe to the patient's gown so that an outward flow of the contrast medium is prevented by the cannula remaining in position. Has patient close lips firmly over needle or tube.
d. Performer orders appropriate overhead sialograms for the condition being studied and has these processed at once.

11. Performer views the first set of sialograms on view boxes as soon as they are processed:

a. Performer determines whether the sialograms are technically adequate to demonstrate the area and condition under study and provide sufficient information to make possible a competent medical interpretation. Performer may ask opinion of another radiologist.
b. Performer observes the structures of the glands, ducts, and any calcification. Evaluates the completeness of the filling. Performer notes whether there is a diffuse increase in density uniformly over the gland or signs of patchy filling.

List Elements Fully

c. Performer decides whether to order additional views, a change in the technical factors, or whether to instill additional contrast medium. Considers the information already available on the radiographs, the way in which the patient responded to the procedure, the patient's condition, and his or her cumulative exposure.
d. If the performer decides to instill additional contrast medium, repeats appropriate steps as described above. Orders radiographs and/or indicates to technologist any orders on additional views such as a change in technical factors or patient positioning.
e. Repeats review of resulting sialograms as described above.
f. Performer considers whether the other side or additional gland should be studied. If so, decides whether the other side or gland should be studied at once or examined at a later time. Considers the purpose of the study, the patient's condition and what has already been seen.

12. If performer will instill the contrast material into another duct at once, performer returns to the patient; gently removes the cannula and syringe from the patient; explains what is to happen next. Repeats the appropriate steps for the other side (or gland), including evaluation of overhead radiographs.

13. When the performer decides that the examination is completed, indicates this to technologist and orders postevacuation films to be taken after an elapse of several minutes. May fill out requisition form. Performer then terminates procedure:

TASK DESCRIPTION SHEET (continued)

Task Code No. 433

This is page 5 of 5 for this task.

List Elements Fully	List Elements Fully
a. Performer returns to patient and reassures. Gently removes the cannula from the duct; detaches the syringe and removes. b. Performer has patient given lemon slices to suck on to induce salivation as a means of evacuating the contrast medium from the glands and ducts. Reassures patient; has contrast spit out into basin. c. Performer indicates that delayed films will be taken. Indicates what side effects may be experienced, such as residual gland edema and pain at mealtime. May prescribe mild analgesic or indicate that this will be available to relieve persistent pain. May fill out order form and sign. d. If performer has decided to order sialography of the other side for a later time, performer fills out requisition sheet with appropriate information and signs. e. Performer orders appropriate sanitary clean up procedures. f. Arranges to have in-patient returned to room after delayed films, or out-patient taken to recovery area. Ensures that any out-patient will be escorted or attended to until able to return home. 14. If performer judges that any emergency signs are in evidence, or if clinician has requested it, performer notifies referring physician of preliminary findings by phone. May discuss. 15. Performer records impressions of procedure on patient's chart: a. Preliminary findings. b. How patient tolerated the procedure. c. Any follow-up care required such as no food or drink for appropriate time and any medication.	d. Delayed films and any additional radiography ordered. e. May sign chart or requisition sheet.

TASK DESCRIPTION SHEET

Task Code No. 434

This is page 1 of 2 for this task.

1. What is the output of this task? (Be sure this is broad enough to be repeatable.)

Sialograms and related intraoral radiographic material read, interpreted; conclusions drawn and recommendations made orally or dictated; clinician called about emergency signs; selected radiographs earmarked for study or library use; material rejacketed; report placed for typing.

2. What is used in performing this task? (Note if only certain items must be used. If there is choice, include everything or the kinds of things chosen among.)

X-ray requisition forms; current sialograms and diagnostic information; view boxes; prior radiographic materials; telephone; dictation equipment; pen; magnifying glass

3. Is there a recipient, respondent or co-worker involved in the task? Yes...(X) No...( )

4. If "Yes" to q. 3: Name the kind of recipient, respondent or co-worker involved, with descriptions to indicate the relevant condition; include the kind with whom the performer is not allowed to deal if relevant to knowledge requirements or legal restrictions.

Co-worker; ordering clinician

5. Name the task so that the answers to questions 1-4 are reflected. Underline essential words.

Reading, interpreting and making recommendations on sialography and related materials or giving opinions to co-workers by reviewing medical information and requisition sheet(s); evaluating new and old films; notifying ordering clinician of emergency signs; explaining opinions or dictating findings and recommendations; placing report for typing.

List Elements Fully

Performer reads and interprets completed sialograms (radiographs of the salivary glands, ducts and alveoli) or provides opinions to co-workers or clinicians when requested on interpretation and conclusions regarding radiographic materials dealing with the relevant procedures.

1. If responding to request, performer goes to where radiographic material is on view on view boxes. Listens while co-worker explains problem regarding how to proceed next, or problem of interpretation.

   If reading and interpreting completed work, performer obtains the jacketed radiographic work-ups. Includes the current set of sialograms, preliminary films, intraoral occlusal films related diagnostic materials, the relevant requisition sheets, and other prior studies if available. Goes to reading area and sets up radiographic materials on view boxes.

2. Asks about, reads, or reviews x-ray requisition forms and materials on patient's medical history, age, sex and size. Notes the reason for the study, the presenting symptoms, the suspected pathology, any related conditions, the details of the study ordered, decisions on technique, any notes made during the procedure, and the preliminary medical impressions recorded di-

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6. Check here if this is a master sheet..(X)

TASK DESCRIPTION SHEET (continued)

Task Code No. 434

This is page 2 of 2 for this task.

List Elements Fully	List Elements Fully
rectly after the procedure (if viewing completed results). Reviews any relevant prior reports or asks to see these and prior radiographs. 3. Performer attempts to read and interpret the radiographs, noting the appearance of the organs being studied, indications of pathological conditions, signs of obstruction, constriction, or stenosis in the vessels or organs, signs of anatomic changes, intragland calcification, duct calculi, gland enlargement, local bone destruction, or inadequate salivary gland function. Performer notes presence or absence of sialo-acinar reflux (hazy or cloudy opacity over the gland), whether it is absent persistently although adequate contrast was introduced; notes space-occupying lesions. 4. Performer decides what to report and/or explain: a. Performer decides whether any abnormalities, changes, or suspicious signs warrant the immediate attention of the patient's clinician. If so, telephones at once and discusses findings (or recommends that co-worker in charge of case do this). b. For own work, performer decides what to report and what recommendations to make based on the type of information requested and the information revealed by the sialograms and related materials. c. In response to request, decides what to recommend to co-worker. Explains interpretations and recommendations verbally, indicating how conclusions were arrived at, including medical and technical considerations. d. Performer dictates findings (for own work) by explaining what appears on	the films. Describes worrisome or suspicious signs, abnormalities and/or changes or lack of growth over time; refers to earlier films as appropriate. (Might indicate presence of artifacts which do not have medical signifance). Indicates what implications can be drawn from findings and what conclusions and/or courses of action are warranted or contraindicated, including need for additional studies, tests, or courses of treatment. e. Dictates report in the style:There is...on.... It has the characteristics of.... I believe that this indicates.... This could mean that .... It is necessary to determine whether.... This can be done by.... 5. Performer may decide whether any of the material is unusual or of special interest and warrants inclusion in museum library or should be used for study purposes. Marks jackets appropriately if so decided. 6. Returns own patient's radiographic material, requisition sheet and tape of dictation to proper jacket, and places to be picked up for typing.

TASK DESCRIPTION SHEET

Task Code No. 435

This is page 1 of 2 for this task.

1. What is the output of this task? (Be sure this is broad enough to be repeatable.)

Radiology resident shown and explained procedures involved with radiography of ears, nose and throat and sialography; resident evaluated for readiness to do activities under supervision; resident observed and criticized; resident evaluated for readiness to do tasks without direct supervision; resident's work spot checked and criticized; questions answered; opinions on work given as requested; evaluation noted informally.

2. What is used in performing this task? (Note if only certain items must be used. If there is choice, include everything or the kinds of things chosen among.)

X-ray requisition forms; materials and equipment needed for radiography of ears, nose and throat and sialography; related radiographs; view boxes; emergency equipment

3. Is there a recipient, respondent or co-worker involved in the task? Yes...(X) No...( )

4. If "Yes" to q. 3: Name the kind of recipient, respondent or co-worker involved, with descriptions to indicate the relevant conditions; include the kind with whom the performer is not allowed to deal if relevant to knowledge requirements or legal restrictions.

Radiology resident to be instructed in ear, nose and throat radiography and sialography;any pt. involved; clinicians;supervisor of residents

5. Name the task so that the answers to questions 1-4 are reflected. Underline essential words.

Providing clinical training for radiology residents in ear, nose and throat radiography and sialography by demonstrating procedures, explaining what is being done, answering questions; deciding when residents can perform tasks under direct supervision;observing and correcting; deciding when tasks can be done without direct supervision; spot checking and correcting; advising as requested or as deemed necessary.

List Elements Fully

Performer provides clinical training to residents in radiology in the area of ear, nose and throat radiography and sialography, covering choice of examinations, medical aspects of procedures, interpretation of radiographic material, and possible recommendations, treatments and alternatives.

1. Performer provides demonstration, explanation, informal evaluation and supervision in: reading requests for radiographic studies and deciding on best procedure, what to look for, available medical and technical procedures including choice of contrast media, means of entry, technical equipment, positions and angles, immobilization, indications, contraindications, prior preparation, sedation, use of anesthetics,emergency care,technical and medical interpretation of radiographic materials, the range of medical conclusions that can be drawn, alternative and additional procedures and tests.

2. When performer is assigned a resident, may select times, patients, and procedures to demonstrate; may explain to resident while performer carries out own tasks, such as reading, interpreting films, or contrast procedures.

   a. Performer explains what will be taught.

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6. Check here if this is a master sheet..(X)

TASK DESCRIPTION SHEET (continued)

Task Code No. 435

This is page 2 of 2 for this task.

List Elements Fully

- b. Performer may narrate the steps, may explain what is being done or shown on films, or may explain the basis for decisions and actions.
- c. Performer may decide to solicit questions to find out what the resident understands; may answer questions. May elaborate on the explanation of what is being done or seen, concentrating on the relevant skills and knowledges.
- d. Performer decides when the resident has observed sufficiently and has a clear enough understanding of a procedure or is ready to carry it out under close, direct supervision and/or to assist.

3. Performer supervises and observes resident carrying out activities assigned:

   - a. Performer asks the resident to do all or part of a procedure or interpretation and remains at the side of the patient or carries out own portion and watches the resident perform the assigned activity.
   - b. While observing, performer decides whether the activity is being done properly, whether there is a specific problem, whether there is need to demonstrate the activity again or explain, and does so.
   - c. Performer may comment on the performance, encourage, or correct as deemed necessary, or do this later.
   - d. Performer may decide to intervene and take over the procedure, explaining to the resident what was done incorrectly at that point or later.
   - e. If decision is to demonstrate again, performer may redo and have the resident observe, or have resident repeat until activity is done properly.
   - f. Performer decides which procedures or activities can be done by the resident without direct supervision (although radiologist remains responsible). Informs proper supervisors, notes for own use, and/or tells this to resident.

List Elements Fully

4. Performer spot checks resident carrying out activities without direct supervision or responds to requests for guidance, assistance, or further instruction.

   Performer proceeds as in steps 2 or 3 as appropriate, observing, noting areas needing improvement, determining nature of problem, assisting, giving opinions, answering questions, and providing further instruction on how to deal with unusual circumstances. Reinforces correct work. Suggests areas for improvement.

5. When patients are present for demonstrations, performer may explain presence of resident; when observing, performer may explain own presence.

6. Performer informally notes the extent of learning or proficiency of resident throughout the training:

   - a. May decide to discuss performance with resident at any time.
   - b. Does not keep formal records on what was taught, or on resident's progress.
   - c. May make personal notes for use in later evaluation meetings.

TASK DESCRIPTION SHEET

Task Code No. 436

This is page 1 of 6 for this task.

1. **What is the output of this task?** (Be sure this is broad enough to be repeatable.)

Pt. examined,reassured;decisions made on whether to go ahead on technique;anesthetic injected;puncture of joint accomplished;knee fluid aspirated;contrast solution injected under fluoroscopic controls;spot films made while joint is stressed,distended and rotated;overhead films ordered;complete set of arthrograms approved;medical impressions and follow-up orders recorded;MD notified of emergency signs.

2. **What is used in performing this task?** (Note if only certain items must be used. If there is choice, include everything or the kinds of things chosen among.)

Pt.'s x-ray requisition,chart,medical records,prior arthrograms;view boxes;emergency cart and supplies; sterile gloves,gown;sterile tray with swabs,drape, forceps,antiseptic solution,dressings,local anesthetic,needles,syringes,iodine based contrast solution, specimen container,vena tube,connector tube;protective lead garments;shielding;order forms;restraining device;fluoroscope with TV monitor,table,spot film device:extension cone;pen;telephone

3. Is there a recipient, respondent or co-worker involved in the task? Yes...(x) No...( )

4. **If "Yes" to q. 3:** Name the kind of recipient, respondent or co-worker involved, with descriptions to indicate the relevant condition; include the kind with whom the performer is not allowed to deal if relevant to knowledge requirements or legal restrictions.

Patient to have arthrography;accompanying adult;referring clinician or orthopedist;radiologist;radiologic technologist;nurse

5. **Name the task** so that the answers to questions 1-4 are reflected. Underline essential words.

Conducting positive contrast arthrography (especially of knee) of any patient by examining and deciding whether to go ahead;reassuring pt.;deciding on technique;infiltrating local anesthetic subcutaneously; making needle puncture into joint space;checking needle placement by noting resistence to injection of anesthetic;aspirating joint fluid;instilling water soluble contrast solution under fluoroscopic control; taking spot films of joint under distension and stress;ordering overheads as decided;approving complete set of arthrograms;recording medical impressions and follow-up care;notifying MD of emergency signs.

List Elements Fully

Performer receives the x-ray requisition form and medical information for a patient scheduled for positive contrast arthrography (radiographic study of the joints,especially knee,after injection of contrast medium into the joint).

1. Performer reads the patient's requisition form and relevant information to become familiar with the case. Notes reasons for ordering the procedure and suspected condition. Notes patient's age, sex, and any diagnostic information already collected:
   a. Performer notes the history of the suspected condition and/or injury, the extent of the resulting disability, and the treatment administered including surgery. Notes especially whether there is acute injury such as fracture or recurring dislocation.
   b. Performer studies on view boxes available prior plain films of the joint or films of prior contrast study of the joint.
   c. Performer notes presence of any contraindications to procedure such as local skin infection. Notes record of how patient tolerated any previous procedures; notes whether patient has history of allergy to iodine based substances or has undergone test for contrast medium.

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6. Check here if this is a master sheet..(x)

TASK DESCRIPTION SHEET (continued)

Task Code No. 436

This is page 2 of 6 for this task.

List Elements Fully

May decide to have test done at once. Checks whether patient may have an infectious or communicable condition, whether a female of child-bearing age is pregnant.

d. Performer checks to see that patient or an authorized adult has signed a consent for the procedure. If not, arranges to have this done; has examination delayed until consent is obtained, or decides to obtain personally.

e. Performer notes any recommendations on technique or indications on the nature of the pathology. May call referring physician or orthopedist to discuss case or obtain additional information.

2. Performer greets the patient and any accompanying adult in examination room:

a. Performer reassures patient and/or adult with patient. Explains what will be done. Indicates what pain may occur. Answers questions. With child, may instruct and demonstrate the procedures to be followed so as to obtain patient's cooperation.

b. Performer questions accompanying adult and/or patient about patient's current symptoms in relation to the condition being studied. May collect additional relevant medical history. Determines whether female patient of child bearing age may be pregnant.

c. Performer examines patient's joint on examination table. Notes the areas of tenderness, evidence of joint effusions, fracture. Notes swelling, the range of motion or extent of locking in the joint and indications of a mass. Notes any symptoms of conditions which contraindicate the procedure such as local skin infection. May evaluate results of allergy test.

d. If appropriate, performer obtains written consent for procedure from

List Elements Fully

patient or authorized adult. Explains the procedure and the risks involved. (Does not proceed unless there is a signed consent.)

3. Performer orders preliminary films (scouts) of anteroposterior, lateral, and tunnel views of joint unless these have recently been taken. Examines on view boxes when processed:

a. Performer considers whether the scout film adequately demonstrates the area under study. If not, indicates changes needed in technical factors or patient positioning to technologist, or records on requisition sheet.

b. Performer notes the condition of the joint on the preliminary films for evidences of fracture. Notes location of the bony planes in preparation for procedure.

4. Performer considers whether there are contraindications to going ahead with the procedure. May have clinician or orthopedist called to discuss patient's current condition and further steps.

If performer decides not to proceed, records reasons and any recommendations on patient's chart. Informs appropriate co-worker(s) of cancellation and has patient returned to home or hospital room. If appropriate, orders rescheduling of patient or scheduling for alternative procedure.

5. If performer decides to proceed, decides on technique and what equipment will be used:

a. Decides on contrast medium (iodine based, water soluble solution unless there is allergy) and amount.

TASK DESCRIPTION SHEET (continued)

Task Code No. 436

This is page 3 of 6 for this task.

List Elements Fully

b. Orders appropriate size needles and syringes.
c. Decides whether to enter with medial or lateral approach. May order a restraining device for applying stress.
d. Informs appropriate staff of decisions and has materials and equipment prepared, including having technical factors set for fluoroscopy and spot filming (using small focal spot).
e. Has patient prepared for sterile injection of local anesthetic and contrast. Has area of the knee shaved (if needed) and prepared for surgery.
f. If appropriate, has container labeled and prepared to receive sample of fluid from joint.

6. When informed that patient and equipment are ready, performer checks that patient and materials have been properly prepared:

a. Checks that all materials needed are present, that emergency cart is present. Has any missing items brought or needed adjustments made.
b. Checks that patient has been properly prepared, shielded, and positioned on x-ray table in appropriate position for injection. Indicates needed adjustments. May have young patient immobilized or decides to do so personally.
c. Reassures patient and does so as deemed necessary throughout procedure. Explains that performer will ask the patient to hold still from time to time during procedure, and does so as appropriate.
d. If performer plans to do spot filming, has cassette inserted in spot film device. Chooses full, half or quarter format and sets as appropriate. (If roll film attachment, checks that attachment is loaded with film or has this done.)

List Elements Fully

e. Dons protective lead garments and sterile gown and gloves when appropriate. Checks staff shielding.

7. Performer prepares syringes with local anesthetic and contrast medium as selected, or checks syringes prepared as shown by nurse.

a. Prepares syringes by checking solution, expelling air, drawing up appropriate amount, expelling bubbles.
b. Inspects contents of syringes for particles. If found, discards and repeats preparation to avoid injection of foreign substance into joint.
c. Attaches connector tube to syringe with contrast solution. Lays syringes on tray.

8. Performer prepares patient for anesthetic. Swabs area of injection site with antiseptic solution. Covers surrounding areas with sterile drape.

9. Performer selects needle and syringe for injection of local anesthetic. Inserts needle into skin and subcutaneous tissue. Injects an appropriate amount of anesthetic so that skin and subcutaneous tissues are infiltrated with anesthetic where the joint is to be punctured. Removes needle; swabs site and waits for anesthetic to take effect.

10. Performer prepares to insert needle for puncture of the joint. Asks patient to hold still.

a. With a medial approach, performer finds the recess at the mid-part of the patella; inserts needle and displaces patella medially toward the needle as it is advanced.

TASK DESCRIPTION SHEET (continued)

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This is page 4 of 6 for this task.

List Elements Fully

List Elements Fully

b. With a lateral approach, performer palpates patella and locates the superior and inferior margins. Inserts needle on lateral side behind patellar margin.

c. May clear needle of any skin tissue before continuing by injecting some anesthetic as soon as skin is punctured, before continuing with puncture.

d. As the performer inserts the needle behind the patella,directs it transversly across the joint toward the center of the patellar cartilage. Notes whether there is the feeling of resistence indicating that the needle has passed through the joint capsule.

e. Performer checks for proper needle entry into joint space by attempting to inject a small amount of anesthetic:

  i) If there is a free flow without pressure or resistence, performer judges that entry is appropriate. Removes syringe.

  ii) If there is resistence to the injection, performer judges that needle placement is improper. May remove syringe and reinsert needle, or checks for fluid.

f. Performer checks for presence of fluid in the joint space and/or for excess fluid as reason for resistance to injection of anesthetic:

  i) Attaches vena tube to needle; using empty syringe, performer suctions back and checks for emergence of fluid.

  ii) If no fluid is expressed and resistence had been encountered, performer advances needle, withdraws, or reinserts needle until performer judges proper needle placement is achieved.

  iii) If fluid is expressed, performer continues to aspirate as much fluid as possible.

  iv) When fluid is aspirated, performer removes syringe and ejects fluid into sterile container. May have container capped, properly labeled, and sent to lab for testing. May record amount and condition of any fluid withdrawn on patient's chart.

g. Performer makes final decision on the amount of contrast material to inject:

  i) Performer may decide that there is excess synovial fluid which will dilute the contrast material. If so, decides on a larger quantity of contrast medium.

  ii) If there has been no resistence to the trial injection of anesthetic, and little or no fluid, performer selects the minimum amount of contrast to inject, considering the patient's size.

  iii) If there is acute injury or pain, performer may decide to inject anesthetic along with the contrast solution. If so, may have syringe prepared with combined solutions in appropriate amounts.

11. Performer injects the contrast material:

a. Performer positions patient to observe injection of contrast solution on TV monitor.

b. Performer positions overhead fluoroscope unit over patient; may have lights in room dimmed. Acti-

TASK DESCRIPTION SHEET (continued)

Task Code No. 436

This is page 5 of 6 for this task.

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vates fluoroscope or has this done by technologist. Performer adjusts unit until the joint with needle is visible on the TV monitor. May indicate needed adjustment in technical factors to technologist. May reposition needle or patient. Turns off fluoroscope.

c. Performer attaches syringe containing contrast solution to the vena tube (attached to puncture needle).
d. Performer injects contrast solution into joint. Activates fluoroscope and observes filling of joint with contrast. Makes sure that contrast flows freely through joint. When filling is judged adequate, performer shuts fluoroscope and removes syringe.
e. When filling is completed,performer withdraws the needle. Swabs area; may apply radiolucent dressing.
f. Throughout procedure performer remains alert to the patient's condition and notes any signs of adverse reaction to the procedure or contrast medium. Decide to provide emergency care if needed.

12. Performer distributes contrast medium in joint by active or passive exercise unless there is known or suspected fracture:

a. Has patient actively flex and extend joint if possible. May check for and explain gurgling sensation or sound made as the contrast flows in and out of recesses in joint. May have patient walk a bit.
b. Performer flexes and extends the patient's joint. May manipulate lower portion of leg.

13. Performer proceeds with fluoroscopy and spot filming using small focal spot and low kV technique:

List Elements Fully

a. Performer may slide extension cone into place under image intensifier to limit size of spot films.
b. Performer may have a joint restraining device placed on examination table to permit stressing of the joint during filming.
c. Performer positions patient on table for viewing the medial meniscus on the TV monitor.
d. Performer uses lead gloves and apron. Activates fluoroscope; adjusts until area of study is in view on monitor.
e. Performer may apply valgus stress (bending outward) to the joint; views the joint and attempts to separate the meniscus from the condyles and tibial plateau. May apply traction. Rotates, stresses and applies traction from the ankle.
f. While viewing on monitor, performer makes spot films of joint; rotates joint and makes additional spot films for appropriate views of each third of the meniscus.
g. Performer activates spot film attachment and x-ray exposure foot control when ready for each spot. If cassette attachment, may have technologist remove cassette as spots are snapped and insert additional cassettes, or does so personally.
h. Performer positions patient for viewing the lateral meniscus. May apply varus stress (bending inward). Performer takes spot films while rotating joint similarly to filming of medial meniscus.
i. Performer may remove the restraint and position patient and fluoroscope unit for filming the cruciate ligaments. Takes spot films as appropriate.

TASK DESCRIPTION SHEET (continued)

Task Code No. 436

This is page 6 of 6 for this task.

List Elements Fully

j. Performer may adjust fluoroscope unit and patient position to observe lateral and medial patellar cartilage. Takes spot films as appropriate.

14. When performer has judged that the fluoroscopic examination is completed, may decide to order additional overhead films such as for suspected fracture or recurring dislocation. If so, indicates to radiologic technologist what views, positions and techniques are required. May order standard AP and lateral films. Has spot films and arthrograms processed at once.

15. Performer looks at the processed spot films and arthrograms on view boxes:

    a. Performer determines whether the radiographs are technically adequate to demonstrate the area and condition under study and provide sufficient detail to make possible a competent medical interpretation. If overheads are not adequate, indicates to technologist what is required, and reviews when ready.
    b. Performer evaluates the relevant structures of the joint; looks for signs of tears, fractures,erosions, lesions, changes of chondromalacia or signs of synovitis. For children, checks for discoid meniscus and tears. May ask opinion of orthopedist or another radiologist.
    c. If performer determines that the radiographs are inadequate,may decide to repeat injection after a proper elapse of time or at a later date. If so, may fill out requisition sheet and sign.
    d. If performer decides to reinject after an elapse of time, repeats appropriate steps and evaluates films as described above.

List Elements Fully

16. Performer arranges for after care for the patient depending on assessment of patient's condition:

    a. Returns to patient. Indicates to patient and/or accompanying adult what side effects may be experienced, such as continuation of gurgling sensation for a day or more. Advises against exercise as appropriate. May prescribe mild analgesic or indicate that this will be available to relieve persistent pain. May fill out order form and sign.
    b. May have dressing applied to puncture site or applies personally.
    c. Ensures that proper clean-up procedures are carried out.
    d. Has patient returned to room or ensures that any out-patient will be escorted or attended to until able to return home.
    e. Performer checks that fluid sample is properly labeled with identification information and appropriate clinical information. Signs requisition sheet for laboratory work if appropriate.

17. If performer has judged that any emergency signs were in evidence, or if orthopedist has requested it, performer notifies physician of preliminary findings by phone. May discuss.

18. Performer records impressions of procedure on patient's chart:

    a. Preliminary findings.
    b. How patient tolerated the procedure.
    c. Special follow-up care required such as analgesic, prohibition on exercise.
    d. Any additional radiography ordered.
    e. May sign chart or requisition sheet sheet.

TASK DESCRIPTION SHEET

Task Code No. 437

This is page 1 of 2 for this task.

1. What is the output of this task? (Be sure this is broad enough to be repeatable.)

Radiographic and related diagnostic materials on bones and joints read, interpreted; medical conclusions drawn and recommendations made orally or dictated; patient's physician called about emergency signs; selected radiographs earmarked for study or library use; material rejacketed; report placed for typing.

2. What is used in performing this task? (Note if only certain items must be used. If there is choice, include everything or the kinds of things chosen among.)

X-ray requisition forms; current radiographs of bones and/or arthrograms; other diagnostic information; view boxes; prior and collateral radiographic materials; telephone; dictation equipment; pen; magnifying glass; ruler; projector; anatomical reference chart

3. Is there a recipient, respondent or co-worker involved in the task? Yes...(X) No...( )

4. If "Yes" to q. 3: Name the kind of recipient, respondent or co-worker involved, with descriptions to indicate the relevant condition; include the kind with whom the performer is not allowed to deal if relevant to knowledge requirements or legal restrictions.

Co-workers; orthopedic surgeons; referring physician; radiologic technologist

5. Name the task so that the answers to questions 1-4 are reflected. Underline essential words.

Reading, interpreting and making recommendations on orthopedic radiographs and/or arthrograms and related studies of bones and joints or giving opinions to clinicians or co-workers by reviewing relevant medical information and requisition sheet(s); evaluating current and prior films and collateral diagnostic materials; notifying referring physician of emergency signs; explaining opinions or dictating findings and recommendations; placing report for typing.

List Elements Fully

Performer reads and interprets completed radiographs of bone and/or joint examinations (orthopedic radiography and arthrography) or provides opinions to co-workers or orthopedic surgeons when requested on interpretation and conclusions; or, in connection with accident cases, receives preliminary radiograph from technologist.

1. If responding to request, performer goes to where radiographic material is on view (on view boxes). Listens while co-worker explains problem regarding how to proceed next, or problem of interpretation.

   If reading and interpreting completed work, performer obtains the jacketed radiographic work-ups. Includes the current set of radiographs, related diagnostic materials, the relevant requisition sheets, and other prior studies if available. Goes to reading area and sets up radiographic materials on view boxes.

2. Asks about, reads, or reviews x-ray requisition forms and materials on patient's medical history, age, sex, and size. Notes the reason for the study, the presenting symptoms, the suspected pathology, any related conditions, the details of the study ordered, decisions on technique, any notes made during the procedure, and the preliminary

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6. Check here if this is a master sheet..(X)

TASK DESCRIPTION SHEET (continued)

Task Code No. 437

This is page 2 of 2 for this task.

List Elements Fully

medical impressions recorded directly after the procedure (if viewing completed results). Reviews any relevant prior reports including lab. reports.

3. Performer attempts to read and interpret the radiographs, noting the appearance of the bones and joints studied, indications or signs of fractures, tears, congenital malformations, lesions, or other pathological conditions:

   a. Performer considers the sex,age, and size of the patient in examining for signs of structural or developmental deformities or anomalies.
   b. Performer may consult standard references indicating developmental stages such as anatomical reference charts; may use ruler, protractor, magnifying glass.
   c. If reading the first radiograph in connection with an accident,performer considers the evidence indicating the location and type of fractures involved and problems of bone fragments. Considers what additional views are required and what patient positions are possible, given the evidence visible on the location of possible fractures.

4. Performer decides what to report and/or explain:

   a. Performer decides whether any abnormalities, changes, or suspicious signs warrant the immediate attention of the patient's physician or orthopedist. If so, telephones at once and discusses findings (or recommends that co-worker in charge of case do this).
   b. For own work performer decides what to report and what recommendations to make based on the type of information requested and the information revealed by the radiographs and related materials.

List Elements Fully

   c. In response to request, decides what to recommend to co-worker. Explains interpretation and recommendations verbally, indicating how conclusions were arrived at, including medical, surgical and technical considerations.
   d. Performer dictates findings (for own work) by explaining what appears on the films. Describes worrisome or suspicious signs, abnormalities, and/or changes in patient over time; refers to earlier films as appropriate. (Might indicate presence of artifacts which do not have medical significance.) Indicates what implications can be drawn from findings and what conclusions and/or courses of action are warranted or contraindicated, including need for additional studies, repeat of examination, additional views, tests, or courses of treatment warranted.
   e. Dictates report in the style:There is...on.... It has the characteristics of.... I believe that this indicates.... This could mean that .... It is necessary to determine whether.... This can be done by....

5. In accident case, may write out requisition indicating positions and views required, area of interest to include. May note what positions are contraindicated.

6. Performer may decide whether any of the material is unusual or of special interest and warrants inclusion in museum library or should be used for study purposes. Marks jackets appropriately if so decided.

7. Returns own patient's radiographic material, requisition sheet, and tape of dictation to proper jacket, and places to be picked up for typing. Gives requisition to staff person if appropriate.

TASK DESCRIPTION SHEET

Task Code No. 438

This is page 1 of 2 for this task.

1. **What is the output of this task?** (Be sure this is broad enough to be repeatable.)

Radiology resident shown and explained procedures involved with radiography of bones and joints; resident evaluated for readiness to do activities under supervision;resident observed and criticized; resident evaluated for readiness to do tasks without direct supervision;resident's work spot checked and criticized; questions answered; opinions on work given as requested; evaluation noted informally.

2. **What is used in performing this task?** (Note if only certain items must be used. If there is choice, include everything or the kinds of things chosen among.)

X-ray requisition forms; materials and equipment needed for radiography of bones and joints; related radiographs; view boxes; emergency equipment

3. **Is there a recipient, respondent or co-worker involved in the task?** Yes...(X) No...( )

4. **If "Yes" to q. 3:** Name the kind of recipient, respondent or co-worker involved, with descriptions to indicate the relevant condition; include the kind with whom the performer is not allowed to deal if relevant to knowledge requirements or legal restrictions.

Radiology resident to be instructed in arthrography and orthopedic radiography;any pt. involved;orthopedic surgeons;clinicians;supervisor of residents

5. **Name the task** so that the answers to questions 1-4 are reflected. Underline essential words.

Providing clinical training for radiology residents in orthopedic radiology and arthrography by demonstrating procedures, explaining what is being done, answering questions; deciding when residents can perform tasks under direct supervision; observing and correcting; deciding when tasks can be done without direct supervision; spot checking and correcting; advising as requested or as deemed necessary.

List Elements Fully

Performer provides clinical training to residents in radiology in the area of orthopedic radiology (bones) and arthrography (joints), covering choice of examinations, special handling, relevant developmental knowledge, medical aspects of procedures, interpretation of radiographic material, and possible recommendations, treatments and alternatives.

1. Performer provides demonstration, explanation, informal evaluation and supervision in: reading requests for radiographic studies of bones and joints and deciding on best procedure; what to look for; available medical and technical procedures including surgical entry,choice of contrast media, technical equipment, positions and angles, special handling and immobilization, indications, contraindications; prior preparation, sedation, use of anesthetics;emergency care;technical and medical interpretation of radiographic materials; the range of developmental and medical conclusions that can be drawn;alternative and additional procedures and tests; and relationships to surgical procedures.
2. When performer is assigned a resident, may select times, patients, and procedures to demonstrate; may explain to resident while performer

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6. Check here if this is a master sheet..(x)

TASK DESCRIPTION SHEET (continued)

Task Code No. 438

This is page 2 of 2 for this task.

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carries out own tasks, such as reading, interpreting films, or contrast procedures.

a. Performer explains what will be taught.
b. Performer may narrate the steps, may explain what is being done or shown on films, or may explain the basis for decisions and actions.
c. Performer may decide to solicit questions to find out what the resident understands; may answer questions. May elaborate on the explanation of what is being done or seen, concentrating on the relevant skills and knowledges.
d. Performer decides when the resident has observed sufficiently and has a clear enough understanding of a procedure or is ready to carry it out under close, direct supervision and/or to assist.

3. Performer supervises and observes resident carrying out activities assigned:

   a. Performer asks the resident to do all or part of a procedure or interpretation and remains at the side of the patient or carries out own portion and watches the resident perform the assigned activity.
   b. While observing, performer decides whether the activity is being done properly, whether there is a specific problem, whether there is need to demonstrate the activity again or explain, and does so.
   c. Performer may comment on the performance, encourage, or correct as deemed necessary, or do this later.
   d. Performer may decide to intervene and take over the procedure, explaining to the resident what was done incorrectly at that point or later.
   e. If decision is to demonstrate again, performer may redo and have the resident observe, or have resident repeat until activity is done properly.

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   f. Performer decides which procedures or activities can be done by the resident without direct supervision (although radiologist remains responsible). Informs proper supervisors, notes for own use, and/or tells this to resident.

4. Performer spot checks resident carrying out activities without direct supervision or responds to requests for guidance, assistance, or further instruction.

   Performer proceeds as in steps 2 or 3 as appropriate, observing, noting areas needing improvement, determining nature of problem, assisting, giving opinions, answering questions, and providing further instruction on how to deal with unusual circumstances. Reinforces correct work. Suggests areas for improvement.

5. When patients are present for demonstrations, performer may explain presence of resident; when observing, performer may explain own presence.

6. Performer informally notes the extent of learning or proficiency of resident throughout the training:

   a. May decide to discuss performance with resident at any time.
   b. May make personal notes on what was taught, or on resident's progress.
   c. May make personal notes for use in later evaluation meetings.

TASK DESCRIPTION SHEET

Task Code No. 440

This is page 1 of 5 for this task.

1. What is the output of this task? (Be sure this is broad enough to be repeatable.)

Decisions on whether to go ahead with computerized transverse axial skull tomography (C.T.T.), the angles,levels,thickness of slices;scans viewed as brightness display on cathode ray tube and/or photographs of scans and/or numerical computer output,interpreted;decision made on repeat,use of IV contrast injection or infusion;IV administered;complete set of transverse axial scans approved;medical impressions and recommendations recorded.

2. What is used in performing this task? (Note if only certain items must be used. If there is choice, include everything or the kinds of things chosen among.)

X-ray requisition form,patient's chart,prior radiographs,scans;view boxes;prepared sterile tray with materials needed for IV infusion or injection of iodine-based contrast solution;tourniquet;materials and equipment on emergency cart;telephone;pen;equipment for computerized transverse axial tomographic scanning,control console,viewing unit;absorption coefficient chart(s);forms

3. Is there a recipient, respondent or co-worker involved in the task? Yes...(x) No...( )

4. If "Yes" to q. 3: Name the kind of recipient, respondent or co-worker involved, with descriptions to indicate the relevant condition; include the kind with whom the performer is not allowed to deal if relevant to knowledge requirements or legal restrictions.

Any neurologic pt.;attending adult,nurse or staff member;radiologist;referring clinician;neurologist; anesthesiologist;radiologic technologist

5. Name the task so that the answers to questions 1-4 are reflected. Underline essential words.

Directing computerized transverse axial tomography of the skull and brain of any pt. by deciding whether to proceed;reassuring pt.;selecting levels,angles, thickness of slices for scans;viewing cathode ray tube,and/or photographs of scan displays,and/or numerical print-out of absorption coefficients;interpreting;deciding whether to repeat,inject or infuse contrast intravenously;continuing as decided with IV;deciding when examination is completed by viewing transverse axial scans;recording medical impressions and needed nursing follow-up.

List Elements Fully

Performer receives the x-ray requisition form and medical information on a patient scheduled for computerized transverse axial tomography of the brain and skull (cross section radiographic scans at various levels of the skull, based on differential radioabsorption of various types of normal and abnormal tissue and other substances; abbreviated as C.T., C.A.T., C.T.T., or E.M.I. or A.C.T.A. scans, depending on equipment).

1. Performer reads the patient's requisition form and relevant information to become familiar with the case or to review materials seen earlier.
    a. Notes patient's age, sex, weight, height, name of referring physician.
    b. Notes nature and location of suspected pathology, size of area of pathology if estimated, and purpose of study, such as screening for diagnostic information,pre- or post-therapeutic evaluation,use in connection with other diagnostic procedures. Notes whether procedure is to be treated as emergency.
    c. Performer reviews patient's clinical history and chart. Examines any prior diagnostic information such as radiographs, ultrasonograms, radioisotope scans,EEG's, prior C.T.T. scans.
    d. Notes recommendations on levels of interest,angulation,thickness of "slice" for the scans,use of den-

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6. Check here if this is a master sheet..(X)

TASK DESCRIPTION SHEET (continued)

Task Code No. 440

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sity enhancement with contrast solution; notes whether routine "base line" study is ordered.

e. Notes whether patient has history of allergies, adverse reaction to iodine-based contrast, has any other collateral conditions such as communicable or infectious condition.

f. Notes whether pediatric or disturbed patient is to be accompanied by attendant, is to have sedation and/or analgesic administered prior to examination, whether this has been carried out. Notes whether general anesthesia may be needed and whether anesthesiologist is on hand.

g. If contrast may be injected, checks to see that patient or authorized adult has signed consent for procedure. If not, informs appropriate co-worker and either has examination delayed until written consent is obtained or arranges to obtain personally.

h. Performer may check that no contrast study has been done in the recent past which would leave a residue of contrast such as gas in the ventricles and subarachnoid spaces and interfere with accuracy of readings.

i. May check that there is no danger of artifacts such as from clips in skull, hearing aids. If clips have been introduced in cranium, performer may plan the angle of the scan to avoid them.

2. Performer greets non-infant patient and any accompanying attendant in examination room. Attempts to reassure; explains what will be done.

   a. May question about patient's symptoms in relation to the condition being studied. May collect additional medical history and ask about previous radiography, allergies.

   b. Performer may explain or demonstrate use of equipment to a child to allay fears and enlist cooperation; answers questions. Explains that patient will be asked to hold still for a considerable period of time. Indicates what will happen. Stresses need to maintain position when ordered.

   c. If contrast may be injected and consent has not been obtained, performer may describe the procedure and its risks and obtain consent signature from patient or authorized adult.

   d. Performer notes whether there are current contraindications to going ahead with the procedure.

      i) May have clinician or neurologist called; discusses.
      ii) If performer decides not to proceed, records reasons and any recommendations on patient's chart. Informs appropriate co-worker of cancellation. If appropriate, orders rescheduling of patient or scheduling for alternative procedure.
      iii) May decide not to use contrast.

   e. With pediatric or disturbed patient performer may consider whether general anesthesia (if suggested) is still warranted; may decide to order if patient's behavior and condition suggest the need.

      i) If general anesthesia is to be carried out, performer discusses with anesthesiologist when it is to be administered and has technologist await indica-

TASK DESCRIPTION SHEET (continued)

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tions from anesthesiologist as to when to proceed.

ii) May order sedation and/or analgesic if appropriate and not already administered.

f. Performer may give final orders on non-contrast phase of examination:

i) Performer indicates whether basic three-scan study is to be done, or specifies number of scans, each providing information on two contiguous slices of tissue in a transverse axial plane on either side of a selected level.

ii) Indicates the levels in cm's above or below a reference line such as the orbitomeatal line, superior orbitomeatal line.

iii) Indicates desired angulation of the slices in relation to the reference line,such as 15° or 25°. Has patient's head flexed as appropriate in relation to machine set-up to achieve angulation.

iv) Indicates the thickness of the slice based on options provided by equipment, patient's age and the amount of detail required.

3. Performer views the results of the C.T.T. scans in one or more of the following ways:

a. Performer may view the cathode-ray tube or TV tube display of the processed information after each scan or by operating viewer controls to retrieve the information from magnetic tape or disc.

i) Performer adjusts picture brightness and contrast controls to appropriate range, or "window width" appropriate for the type of tissues and pathologies of interest.

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ii) With some equipment performer may select a color coded key for the display, with each color representing a given density range. Selects combinations of colors for the contrasting or continuous density spectrum as appropriate to viewing unit control panel.

iii) Depending on equipment, performer may use selector to blacken all picture elements at a given range, or to have elements in a given range "flicker."

b. Performer may have Polaroid or other photographs made of the visual display, and examines when processed. If so, may select the "window width" for scaling unless this has been predetermined for a given area of interest. Selects other options as described in a, above.

c. Performer may review the printed output in a format shaped roughly as the slice, with relative numerical density values printed out.

4. Performer reads and interprets the results by referring to a reference chart in brightness or numerical gradations in which the standard relative absorption coefficients for water, gas, and relevant normal and abnormal tissues are listed. Compares with the results of the scans.

a. Performer interprets white areas as tissues of highest density, black areas as tissues of lowest density, and grey areas as tissues of intermediate densities.

b. Interprets alterations of normal tissue density in terms of the pathological changes known to produce such alterations.

TASK DESCRIPTION SHEET (continued)

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c. Performer may be alert for the effects of computer averaging where there is abrupt drop from high density tissue, such as bone, next to low density material, such as cerebral fluid, or patient motion.

d. Performer attempts to make an initial interpretation of the data for the purposes requested, such as identification of lesions arising from traumas, cerebro-vascular accidents, distinction between hemotoma and edema, hemorrhage and infarction, or other indication of normal or abnormal scans. Compares the two hemispheres of the brain with each other for reference.

5. Performer determines whether the C.T.T. scans are technically adequate to demonstrate the area under study and provide adequate information on the nature and position of the pathology. Performer may ask opinion of another radiologist or neurologist.

a. If performer is unsure about the adequacy of the information, may decide to repeat the scans at one or more levels after intravenous infusion or injection of an iodine based contrast medium (to enhance tissue density and improve the differential contrast in the absorption values between normal and abnormal tissue).

b. If performer considers that there is an artifact due to residual contrast, patient movement, or objects such as clips, may order repeat of one or more scans after appropriate elapse of time and/or with positioning to overcome the problem, and/or use of a motion control setting on the machine.

c. Performer may order a repeat of the examination with modification such

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as additional level(s), change in thickness of slice, angulation.

d. If performer decides to order additional scans and/or proceed with injection or infusion of contrast, performer informs technologist; indicates what is needed; may record.

6. If performer decides to inject or infuse contrast and repeat the C.T.T. scans, proceeds as follows:

a. Performer decides whether to inject contrast or use continuous infusion over a given period of time. Orders type and amount of contrast based on patient's age, size, and area of interest.

b. Makes sure that materials are present for IV infusion or injection as decided. Performer has patient prepared and checks that procedure tray and emergency cart are present and properly equipped.

c. If performer is to proceed with IV infusion of the contrast solution, checks prepared IV bottle containing appropriate dosage of radiopaque solution. Makes sure dosage is appropriate and that there is no evidence of chemical deterioration.

i) Sets up IV infusion apparatus near patient. Attaches bottle of prepared contrast solution to sterile IV tubing. Hangs at appropriate height on pole near patient with clamp in closed position.

ii) Prepares patient for insertion of IV needle by exposing vein selected, applying tourniquet, and swabbing site with antiseptic solution. Inserts IV needle with sterile loop attached.

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Removes tourniquet. Tapes needle into position. May immobilize limb.

iii) Runs fluid through tubing to check flow and remove air. Attaches loop of needle to IV tubing. Adjusts flow in tube to desired rate and starts infusion.

iv) Checks on patient while infusion is in process.

d. If performer is to proceed with IV injection of the contrast solution, performer may prepare patient personally by exposing arm, applying tourniquet, finding vein, and swabbing site with antiseptic solution, or has this done.

i) Performer selects or checks prepared dose of radiopaque solution in syringe. Expels air; checks amount as above, and makes sure there is no chemical deterioration.

ii) Inserts needle into vein, checking location by aspirating slightly to note venous return. Removes tourniquet and injects contrast. May inject small amount of contrast, observe reaction, and inject full amount if no reaction. Removes needle and swabs site.

e. Performer observes patient for signs of adverse reaction to the infusion of contrast solution. If there is a reaction, performer decides to proceed with emergency care. Removes patient from contrast flow at once.

f. If there are no serious adverse reactions, performer tells radiologic technologist when to go ahead with C.T.T. scans as described above. May indicate proper elapse of time. Repeats specifications as appropriate.

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g. Performer remains on call in case of delayed reaction during radiographic examination. If there is a delayed serious reaction, performer proceeds with emergency care.

7. For additional C.T.T. scans performer proceeds as described above. Repeats review of C.T.T. scans as described above until satisfied that they are technically adequate to demonstrate the areas and conditions under study and to provide sufficient information to make possible a competent medical interpretation. Takes account of effects of contrast agent in interpreting densities.

8. Performer decides when the transverse axial tomographic examination is completed. Informs anesthesiologist (if present), technologist and other staff that procedure is to be terminated.

a. Performer may return to the patient. If patient is conscious, performer reassures and explains what will happen next.

b. Removes IV apparatus (if used for contrast) or has this done. If appropriate, has appropriate sanitary clean up procedures carried out.

c. If requested, calls neurologist or clinician and reports preliminary findings and results. May have C.T.T. photographs delivered to clinician.

d. Records impressions of procedure on patient's chart:

i) Preliminary findings.

ii) How patient tolerated procedure.

iii) Any special nursing follow-up recommended.

iv) May sign chart or requisition sheet.

TASK DESCRIPTION SHEET

Task Code No. 441

This is page 1 of 3 for this task.

1. What is the output of this task? (Be sure this is broad enough to be repeatable.)

Decision made on ordering and/or deciding on type of radiographic procedure to order for pediatric pt. or referral made; orders given on views to take; prior preparation or procedures ordered; recommendations made on technique, contrast material; record entered of decisions, orders, and/or recommendations; record placed for scheduling; scheduling expedited if so decided.

2. What is used in performing this task? (Note if only certain items must be used. If there is choice, include everything or the kinds of things chosen among.)

X-ray requisition form, patient's chart; relevant radiographic and other diagnostic materials; telephone; view boxes; pen; dictating equipment; bone-age tabulations

3. Is there a recipient, respondent or co-worker involved in the task? Yes...(X) No...( )

4. If "Yes" to q. 3: Name the kind of recipient, respondent or co-worker involved, with descriptions to indicate the relevant condition; include the kind with whom the performer is not allowed to deal if relevant to knowledge requirements or legal restrictions.

Physician requesting radiography for pediatric patient; pediatrician; surgeon; radiologist; clerk

5. Name the task so that the answers to questions 1-4 are reflected. Underline essential words.

Deciding on type of pediatric radiographic examination(s) to order for pediatric patient in consultation with referring physician and/or pediatric specialist, by reviewing case history and relevant materials, discussing, considering indications, contraindications, alternatives and deciding what procedure(s), if any, to order; or referring clinician to other specialist; deciding whether to order adult or pediatric procedure; specifying views, prior procedures, medication, preparation; requesting additional tests or information; recommending technique, contrast medium; recording decisions and recommendations; arranging for scheduling.

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Performer decides on what radiographic examination to order for a pediatric patient upon receipt of a request from a referring physician on an x-ray requisition form, by phone, or in person. The examination(s) requested may cover any specialized procedure in pediatric practice or a procedure applicable to adults and children alike.

1. Performer reads the x-ray requisition form and the patient's history to learn the nature of the problem, the presenting symptoms, the suspected pathology, the studies and/or procedures requested, and special requirements. Notes whether request is urgent with a need for an immediate diagnosis.
    a. Performer notes the patient's age, sex, and size, whether patient is a premature birth. Notes any related medical history concerning the delivery and the mother's condition.
    b. Performer studies the relevant medical history and recorded symptoms of the patient, the suspected location of the pathology, and relevant background information. If any prior tests have been carried out, performer notes results. If any relevant prior radiographs, radioisotope scans or ultrasonograms are available, per-

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former studies these and their related reports to become more familiar with the nature of the current diagnostic information.

c. Performer notes evidence of the presence of conditions which are contraindications to the procedure requested or which would affect the choice of a contrast medium and decisions on prior preparation of the patient.

d. Performer notes patient's radiographic history, any evidence of adverse reaction to contrast media, how patient tolerated prior studies. Performer notes whether patient has a communicable or infectious condition.

e. If the performer finds that the information provided is inadequate, performer arranges to have other materials sent or discusses needed information with referring physician or pediatrician.

f. Performer may decide to refer clinician to a radiologist in a specific specialty area.

2. Performer decides whether there are contraindications to the procedure requested.

   a. Performer considers any contraindications in relation to the need for additional information. Considers the severity of the symptoms, the extent of definition on any current radiographs, and/or the suddenness of the appearance of the abnormalities in relation to the possible adverse affects of procedure on patient.

   b. Performer considers alternative studies which could fill the need for additional information with less risk to the patient or with better results. Considers whether any alternative studies are preferable.

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   c. May discuss with another radiologist or appropriate pediatrician or surgeon.

   d. Performer decides whether to approve request, order additional or alternative studies, reorder earlier studies, or recommend no radiography, based on the information obtained and any discussion.

3. If performer recommends against a request, discusses with referring physician and writes reasons for refusal o requisition sheet; may destroy requisition if agreed to by referring physician.

   If requested by physician, performer dictates a report on the decision, presenting his or her interpretation of any current radiographs, assessment of case, reason for refusal, and any other relevant comments. Returns materials on patient, and places dictated report to be picked up for typing.

4. If performer decides to approve the request for the study, or if performer and physician agree on alternative studies, performer may recommend specific techniques such as the following:

   a. Performer may decide whether the patient's age and size warrant an adult procedure or a specialized pediatric procedure; may decide whether a preliminary set of plain films should be made or a contrast study should be ordered. Depending on decision, performer may transfer requisition sheet to regular x-ray department.

   b. Performer may specify which side is to be studied and the views required. Records on requisition sheet.

TASK DESCRIPTION SHEET (continued)

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c. For a bone-age study performer decides whether to order view for a routine screening (PA of a hand and wrist) or to select appropriate views of ossification center(s) used for maturity indicators appropriate to patient's age. If the latter, performer may consult a tabulation listing the major ossification centers by age-of-appearance of indicators.

d. Performer may order preliminary procedures or prior preparation of patient or may discuss with attending pediatrician and have this done. Such orders may include any or all of the following:

  i) Collection of relevant information such as lab test results, electrolyte level, genetic sex, result of allergy test to contrast medium, mother's medical records.
  ii) Prior abstinence from food and/or drink, cleansing enema, and/or cathartic, and appropriate timing for these, based on the patient's age, the suspected pathology, and contraindications.
  iii) Prior administration of an intravenous infusion, sedation, or medication to reduce possible allergic reaction.
  iv) Prior endoscopy or intubation such as in preparation for small bowel enema study.
  v) Special procedures to prevent infection or contamination of the patient or environment.

e. Performer may arrange to have the patient's pediatrician and/or a surgeon, anesthesiologist or attending clinician present for the procedure.

f. Performer records orders as appropriate.

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5. If performer decides to order a contrast study, performer may make recommendations on the procedure and technique; may discuss with referring physician. Such recommendations may include any or all of the following:

   a. In cases where studies may have several contingent options, such as inferior vena cavagram with excretory urography, or excretory urography following peritoneography, performer decides whether to recommend the optional procedure.
   b. Performer may suggest the contrast medium and/or route of introduction based on the patient's age, condition, size, suspected pathology, and contraindications.
   c. Performer may make sure that an authorized adult is seen in order to provide a written consent for the procedure.
   d. Performer records and/or arranges as appropriate.

6. Performer considers the urgency of the need and, if appropriate, expedites scheduling personally by discussing with appropriate staff.

7. Performer writes out orders and recommendations as appropriate so that physicians, nurses, technologists and other personnel can prepare patient or be scheduled for work.

8. Performer gives information to appropriate secretary for schedu[illegible]ns requisition sheet if appropria[illegible]

TASK DESCRIPTION SHEET

Task Code No. 442

This is page 1 of 4 for this task.

1. What is the output of this task? (Be sure this is broad enough to be repeatable.)

Accompanying adult reassured;pediatric pt.'s choanas tested for patency with probe;decisions made on whether to do choanal radiography and on technique; anesthesiologist informed;nasopharyngeal tube inserted;contrast medium instilled;spot films taken;overhead radiographs ordered;diagnosis of unilateral or bilateral choanal atresia confirmed or disproved;referring physician informed of emergency condition; medical impressions,recommendations recorded.

2. What is used in performing this task? (Note if only certain items must be used. If there is choice, include everything or the kinds of things chosen among.)

X-ray requisition form;medical records and charts of pt. (and mother of pt. if neonate);emergency cart; shielding,protective lead garments;sterile gown, mask,gloves;immobilization devices;nasal decongestant,dropper;sterile catheter or probe;radiopaque contrast medium;x-ray table;fluoroscope unit,TV monitor,spot film device;sterile syringes;sterile nasopharyngeal tubes;saline solution;centimeter scale; airway;pen;telephone

3. Is there a recipient, respondent or co-worker involved in the task? Yes...(X) No...( )

4. If "Yes" to q. 3: Name the kind of recipient, respondent or co-worker involved, with descriptions to indicate the relevant condition; include the kind with whom the performer is not allowed to deal if relevant to knowledge requirements or legal restrictions.

Infant or neonate with suspected choanal atresia;radiologic technologist;referring MD;accompanying adult;radiologist;nurse;anesthesiologist

5. Name the task so that the answers to questions 1-4 are reflected. Underline essential words.

Conducting choanal radiography of pediatric patient by conducting clinical test for choanal atresia by attempting to insert catheter into nasopharynx;deciding whether to go ahead;reassuring accompanying adult;having anesthesiologist present;deciding on technique;instilling contrast medium through nasopharyngeal tube to point of obstruction;monitoring with fluoroscopy and taking spot films,and/or ordering overheads;determining whether choanal atresia diagnosis is confirmed;informing referring MD of need for immediate surgery;recording medical impressions and needed follow-up care.

List Elements Fully

Performer receives the x-ray requisition form and medical information for a pediatric patient scheduled for choanal radiography (a study of the paired openings between the nasal cavity and the nasopharynx) where unilateral or bilateral atresia (absence of opening or occlusion) is suspected.

1. Performer reads the patient's requisition form and relevant medical information (including mother's if patient is a neonate) to become familiar with the case or to review material seen earlier.
   a. Performer notes patient's age;reviews any diagnostic information already collected. Notes especially whether patient is a neonate with immediate diagnosis and treatment of bilateral choanal atresia necessary to prevent death from asphyxia. Notes, if unilateral atresia is suspected, which nostril is involved.
   b. Notes whether any condition may be present which may be occluding one nostril (such as rhinitis), thus creating functional bilateral atresia.
   c. With neonate, performer notes whether the mother is taking any medication (such as reserpine), which may create inflamed, fluid filled nasal mucosa.

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d. Performer notes whether patient has an oropharyngeal airway in place to prevent respiratory distress; notes whether there is a request from the referring physician for measurement of the occluding septum.

2. Performer greets any non-infant patient and any adult accompanying the patient in the examination room. Attempts to reassure. Explains what will be involved in the procedure. Answers questions. Performer questions accompanying adult about patient's current symptoms in relation to the condition being studied. May collect additional relevant medical history.

   If anyone is to remain in examination room, performer makes sure that he or she is properly shielded. Performer makes sure that all individuals to be in contact with a neonate patient are following proper sanitary procedures. Dons lead protective garments and sterile gown, mask, and gloves.

3. Performer may decide to examine patient:

   a. Has patient placed appropriately on examination table.
   b. Performer may instill a pediatric strength nasal decongestant into each nostril using a dropper.
   c. Performer may then test for choanal atresia clinically by using a sterile firm catheter or probe. Performer inserts into each nostril and notes whether it is possible to enter the nasopharynx.

4. Performer considers whether it is still necessary to go ahead with the procedure or whether any obstruction is due to inflamed mucosa. May have clinician called and discusses patient's current condition.

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   a. If performer decides not to proceed, records reasons and any recommendations on patient's chart. Informs appropriate co-worker.
   b. If performer decides to proceed, performer makes final decisions on technique.
   c. Performer orders a preliminary scout film. Examines on view box as soon as it is processed. Indicates to technologist any needed changes in technique and evaluates the skull structures evident on the film. Notes whether any obstructions are visible.
   d. Performer decides on contrast medium to use.
   e. Performer informs appropriate co-workers of decisions and has patient, materials,and equipment prepared, including having technical factors set for fluoroscopy.
   f. Arranges to have anesthesiologist stand by during procedure.

5. When informed that patient and equipment are ready, performer checks whether patient has been properly prepared.

   a. Checks that all materials needed are present, that emergency cart is present.
   b. Checks that patient has been properly shielded, immobilized, and positioned on x-ray table.
   c. Has any needed changes or adjustments made.
   d. If fluoroscopy is to be used, and if fluoroscope has spot film attachment that uses cassettes, performer has cassette inserted. Chooses full, half or quarter format and sets as appropriate. (If roll film attachment, checks that this is loaded with film or has this done.)
   e. If patient has an oropharyngeal airway in place, makes sure that this

TASK DESCRIPTION SHEET (continued)

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has not been disturbed and that patient is not in respiratory distress. Performer remains alert to patient's respiration throughout the procedure.

   f. Performer has syringe prepared with the selected contrast medium.

6. Performer inserts a sterile nasopharnyngeal tube into one nostril (the one of interest if unilateral occlusion is involved). Inserts tube in nasal vestibule up to the point that the obstruction is felt. May tape in place.

7. Performer positions fluoroscope unit over patient for viewing on TV monitor. May have lights in room dimmed.

8. Performer attaches syringe with contrast medium to protruding end of tube and injects an appropriate amount of the contrast solution.

   a. Performer activates fluoroscope and watches the progress of the solution on the TV monitor, noting whether there is any entry of the contrast medium into the nasopharynx.
   b. Performer may take appropriate spot films by activating spot film attachment and foot pedal when desired view is obtained on monitor. If cassette attachment, may have technologist remove cassette as spots are snapped and insert additional cassettes, or does so personally. Has spot films processed immediately. Shuts fluoroscope when observation is completed.
   c. Performer may order overhead films when instillation is completed. If so, indicates what is needed to technologist when ready.

9. Throughout procedure performer remains alert for possible respiratory distress caused by occlusion of both nostrils or passage of the contrast medium into the nasopharynx. Has anesthesiologist take charge of any emergency procedures needed.

10. Performer looks at the processed spot films and any radiographs on view boxes as soon as they are ready:

   a. Determines whether the radiographs are technically adequate to demonstrate the area and condition under study and provide sufficient information to make possible a competent medical interpretation.
   b. Performer decides to take additional views, change the technical factors, or attempt to instill additional contrast medium only in extreme circumstances.
      If so, performer indicates what is needed to technologist. Repeats appropriate steps as described above.

11. If bilateral choanal atresia is suspected, performer continues with study:

   a. Performer flushes the opaque medium from the choana already studied by using syringe filled with saline solution and flushing through nasopharyngeal tube.
   b. Performer gently removes the nasopharyngeal tube.
   c. Performer then inserts a tube into the other nasal cavity. Repeats appropriate steps as for the first choana, including radiography.

12. Performer indicates to radiologic technologist when the radiographic examination has been terminated. Orders appropriate sanitary clean up procedures as appropriate.

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13. When the full set of radiographs have been processed, performer inspects them to determine whether the contrast medium has entered the nasopharynx or whether there is atresia; determines whether the atresia is bilateral or unilateral, whether complete or incomplete, and whether the obstruction is bony or membranous. Performer may ask opinion of clinician or another radiologist.

    a. If bilateral atresia is confirmed for a neonate, performer calls the patient's attending pediatrician at once, and discusses immediate steps such as continued use of an oropharyngeal airway, feeding through a tube passed into the stomach (gavage) and immediate surgery.
    b. If requested, performer may measure the thickness of the occluding septum by measuring the distance separating the opaque medium in the posterior nasal cavity from the air column in the nasopharynx as indicated on the radiographs.

14. Performer records impressions of procedure on patient's chart:

    a. Findings and determination.
    b. How patient tolerated the procedure.
    c. Special follow-up care recommended.
    d. May sign chart or requisition sheet.

TASK DESCRIPTION SHEET

Task Code No. 443

This is page 1 of 5 for this task.

1. **What is the output of this task?** (Be sure this is broad enough to be repeatable.)

Decision jointly made on whether to do bronchography and area to study;technique decided on; contrast medium instilled in bronchus through endotracheal tube under fluoroscopy; spot films taken; condition observed on TV monitor; bronchograms ordered;decisions jointly made on additional bronchography,delayed films;complete set of radiographs approved;orders on delayed films and medical impressions recorded.

2. **What is used in performing this task?** (Note if only certain items must be used. If there is choice, include everything or the kinds of things chosen among.)

X-ray requisition form;pt.'s chart,medical records; radiographs;view boxes;emergency cart and supplies; endotracheal tube (inserted); injection catheter;syringes;shielding;lead apron;sterile gown;gloves, mask;tilt table;fluoroscope unit, TV monitor, spot film device with cassettes or roll film; contrast medium (iodized oil or barium sulfate solution);pen

3. Is there a recipient, respondent or co-worker involved in the task? Yes...(X) No...( )

4. If "Yes" to q. 3: Name the kind of recipient, respondent or co-worker involved, with descriptions to indicate the relevant condition; include the kind with whom the performer is not allowed to deal if relevant to knowledge requirements or legal restrictions.

Pediatric pt. to undergo bronchography;attending pediatrician;anesthesiologist;surgeon;radiologic technologist;accompanying adult;nurse;clerk

5. **Name the task** so that the answers to questions 1-4 are reflected. Underline essential words.

Conducting bronchography of pediatric patient in consultation with pediatrician(s) and anesthesiologist by jointly considering whether to go ahead;deciding on technique;instilling contrast medium into bronchus with injecting catheter through previously inserted endotracheal tube under fluoroscopic control; taking spot films and/or ordering bronchograms; viewing and jointly deciding whether to study other bronchus;removing contrast medium with gravity and aspiration;cooperating in giving emergency care; ordering delayed films;recording as appropriate.

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Performer receives the x-ray requisition form and medical information on a pediatric patient scheduled for bronchography (radiographic examination of the lung and bronchi after instillation of contrast medium in bronchus). Patient will already have received prior postural drainage and/or medication.

1. Performer reviews the patient's requisition form and relevant medical information, including patient's age and sex and any diagnostic information already collected. Examines prior radiographs on view boxes.
   a. Performer notes any recommendations and notations made on site of pathology, technique, or contrast medium. Notes any other relevant medical information such as allergy to contrast media and conditions which might be contraindications to the procedure. Checks whether patient may have an infectious or communicable condition.
   b. Performer checks to see that an authorized adult has signed consent for procedure. If not, informs appropriate co-worker and arranges to have obtained.

2. Performer joins the team of pediatrician(s), anesthesiologist,surgeon or other co-worker, radiologic technologist, and nursing staff as

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determined by institutional arrangements:

a. If a relative of the patient is present, performer may greet the individual and explain what will occur.
b. Performer makes sure that anyone to remain in room during examination is properly shielded with protective lead garments.
c. Performer checks that the patient is properly shielded and orders a scout film of the patient. Performer discusses patient's condition with the attending MD and anesthesiologist. May collect additional relevant medical history.

3. Performer views scout film on view box:

a. Evaluates whether the technical factors and patient position are appropriate to produce satisfactory radiographs. If not, indicates to technologist what adjustments are needed.
b. Performer also notes the appearance of lung tissue to determine which half of the bronchial tree appears to be more diseased. May compare with earlier radiographs and/or prior bronchograms.

4. Performer and attending physicians jointly consider whether there are contraindications to going ahead with the procedure based on the clinical information and the scout film.

a. If the decision is not to proceed, may record reasons and any recommendations on radiography on patient's chart. If appropriate, orders rescheduling of patient or scheduling for alternative procedure.
b. If the decision is to proceed, performer indicates to anesthesiologist that the endotracheal tube can be inserted (as far as the carina), and that general anesthesia can be administered.
c. Performer makes final decisions on the contrast medium to use, areas of the bronchial tree to study, and whether to do bilateral or unilateral study, based on clinical history and radiographs. Discusses with attending physicians.
d. Decides on contrast medium based on patient's allergies. (Uses barium sulfate solution or suspension rather than iodized oil if patient may have allergy.)
e. If iodized oil is to be used, performer may have co-worker heat the contrast medium to appropriate temperature.
f. Has materials and equipment prepared and technical factors set for fluoroscopy.

5. When informed that patient and equipment are ready, performer checks whether patient has been properly immobilized, positioned and shielded.

a. Performer checks with anesthesiologist to be sure that patient is ready for instillation (that the anesthesia is at a depth sufficient for the child not to "buck" or cough when the medium is introduced, and that the anesthesiologist need supply little or no assistance by bag-squeezing).
b. Performer makes sure that the patient's cardiac rate will be properly monitored and that the patient's color and respiration will be checked.
c. Performer checks that all materials needed are present, that correct drugs and sizes of items are present. Checks that emergency cart is present. Has any needed changes or adjustments made.

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   d. Performer dons lead apron and sterile gown, gloves, and mask, when appropriate.
   e. Performer has cassette inserted in spot film attachment. Chooses full, half or quarter format and sets as appropriate. (If roll film attachment, checks that attachment is loaded with film or has this done.)

6. When performer decides to proceed with instillation of contrast medium, performer prepares a syringe with the contrast solution decided upon or has this done. If iodized oil, makes sure that it is at desired temperature.

7. Performer positions the fluoroscope unit over the patient so as to best observe the location of the endotracheal tube. Activates fluoroscope and assesses the location of the endotracheal tube with respect to the carina (projection of the lowest tracheal cartilage). If not in appropriate position above the carina, performer discusses and has tube adjusted by anesthesiologist.

8. Performer attaches syringe to sterile injection catheter and inserts distal end of catheter into the sidearm of tubing connecting the endotracheal tube with the anesthetizing equipment.

   a. Inserts catheter so that medium will be delivered just below the endotracheal tube, while checking on monitor. Shuts fluoroscope when the catheter position is judged to be appropriate.
   b. Performer has patient placed by coworkers so that the more diseased side of the bronchial tree will be filled first. Has patient turned appropriately towards the side of the chest to be filled.
   c. Performer uses syringe with contrast medium and injects an appropriate amount through the catheter.

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   d. Performer activates fluoroscope. Observes the process of filling of the segmental bronchi. Performer utilizes the tilt table controls or has patient rotated so that the contrast medium flows to the unfilled bronchi. Observes the structure of the organs as they are filled. May have technical factors adjusted. Performer may inject additional contrast until proper delineation appears on monitor.
   e. Performer decides on what spot films to take during the filling process and after. Notes signs of pathology and any obstructions. Activates spot film attachment and x-ray foot pedal as appropriate. If cassette attachment, may have technologist remove cassette as spots are snapped and insert additional cassettes, or does so personally.
   f. Decides when the given side has been sufficiently filled. Decides when fluoroscopy is completed and sufficient spot films have been taken.

9. Throughout procedure performer checks on the patient's condition as indicated by appearance, cardiac monitoring and monitoring by anesthesiologist. Is alert for possible severe reactions such as respiratory distress, cardiac arrest, or adverse reaction to contrast medium:

   a. Performer assists attending physicians to determine the nature and severity of the condition. Helps remove all instruments from patient.
   b. Depending on the symptoms, performer may assist in carrying out any or all of the following emergency procedures using equipment on emergency cart:

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i) May administer oxygen or air using oxygen tank and mask or ambu bag.
ii) May clear airway. May assist in establishing an airway.
iii) May assist in deciding on and administering IV infusion (such as barbiturates).
iv) Performer may suggest and assist in administering adrenalin, parenteral hydrocortisone, antihistamine, a vasopressor in solution or other appropriate drugs.

c. Performer cooperates in deciding whether the reaction is sufficiently controlled to continue with the procedure.
d. When patient has been revived, performer may record reaction and what was done on patient's chart.
e. If the decision is to terminate, indicates this to appropriate staff.

10. Performer orders standard radiographic series or specifies views as appropriate after filling.

11. Performer looks at the processed spot films and bronchograms on view boxes as soon as they are ready:

a. Determines whether the radiographs are technically adequate to demonstrate the area and condition under study and provide sufficient information to make possible a competent medical interpretation. Performer confers with attending physicians.
b. Performer decides whether to order additional views, a change in the technical factors, or whether to instill additional contrast medium. Considers the information already available on the radiographs, the way in which the patient responded to the procedure, the patient's condition, and his or her cumulative exposure.
c. If the performer decides to instill additional contrast medium, repeats appropriate steps as described above. Indicates to technologist any orders on additional bronchograms such as change in technical factors. Indicates to co-workers any needed patient positioning.
d. Repeats review of resulting bronchograms as described above.
e. Performer discusses with physicians whether the other bronchus should be studied. If so, cooperates in deciding whether the other side should be studied at once or examined at a later time. Considers the purpose of the study, the patient's condition and what has already been seen.

12. Performer returns to the patient to remove the medium instilled in the first side. Uses gravity and aspiration:

a. Performer attaches empty syringe to injection catheter.
b. Performer adjusts the inclination of the table and pulls back on the syringe plunger so that the contrast medium drains out by gravity and aspiration. Performer may note progress by looking at the image of the medium on the TV monitor. Performer determines when the medium has been appropriately removed.

13. If the decision has been made to proceed immediately with bronchography of the other side, performer then proceeds with instillation of the medium in the other side:

TASK DESCRIPTION SHEET (continued)

Task Code No. 443

This is page 5 of 5 for this task.

List Elements Fully	List Elements Fully
a. Checks patient's condition. May check position of endotracheal tube and injection catheter on TV monitor and adjust as necessary. Has patient positioned for filling the other bronchus as described above. b. Performer repeats all the appropriate counterpart steps to fill the other side. c. Performer carries out spot filming and orders for overhead radiographs as appropriate. d. Performer evaluates the second set of radiographs as described above, conferring with attending physicians in evaluating the adequacy of the films and their interpretation. 14. When the radiographic examination is completed, performer informs technologist and removes the contrast material from the second side as described above. 15. Performer may order delayed film(s) to be taken after a proper elapse of time. If so, may fill out appropriate requisition and/or has this done. 16. Performer may confer with pediatrician and/or anesthesiologist about recovery procedures and other aspects of the case. When performer is satisfied that his or her part of the procedure is terminated, performer leaves the patient in the care of the pediatrician and anesthesiologist. 17. Performer may record impressions of procedure on patient's chart: a. Preliminary findings. b. How patient tolerated the procedure. c. Any delayed films or additional radiography ordered. d. May sign chart or requisition sheet.	

TASK DESCRIPTION SHEET

Task Code No. 444

This is page 1 of 6 for this task.

1. **What is the output of this task?** **(Be sure this is broad enough to be repeatable.)**

Decision made on whether to go ahead;procedure explained;patient reassured;decisions made on injection or infusion technique,amount of contrast;test dose of contrast introduced;pt.'s reaction evaluated; emergency care administered and/or full dose of contrast solution injected or infused as decided;tourniquets applied and removed as needed;orders given on urograms,inferior vena cavograms,special views;complete set of radiographs approved;delayed films,follow-up care ordered;medical impressions ordered, recorded.

2. **What is used in performing this task?** **(Note if only certain items must be used. If there is choice, include everything or the kinds of things chosen among.)**

X-ray requisition form;pt.'s chart;scout film;view boxes;sterile procedure tray with antiseptic solution,pad,gauze,iodine based contrast solution,saline,needles,materials for IV infusion or injection; tourniquets;emergency cart;telephone;pen;atropine or antihistamine;immobilization devices;arm board;carbonated beverage;shielding;sterile gown,gloves

3. **Is there a recipient, respondent or co-worker involved in the task?** Yes...(X) No...( )

4. **If "Yes" to q. 3:** **Name the kind of recipient, respondent or co-worker involved, with descriptions to indicate the relevant condition; include the kind with whom the performer is not allowed to deal if relevant to knowledge requirements or legal restrictions.**

Pediatric pt. to have excretory urography;accompanying adult;referring MD;pediatrician;radiologist;radiologic technologist;nurse

5. **Name the task so that the answers to questions 1-4 are reflected. Underline essential words.**

Conducting intravenous excretory urography (IVP) and inferior vena cavography of pediatric pt. by checking scout film,reassuring pt.;deciding whether to go ahead;deciding on infusion or injection technique, amount of contrast;applying tourniquets for vena cavography;injecting or infusing iodine based contrast medium in appropriate vein;observing reactions and deciding on whether to proceed;administering full dosage and/or providing emergency care;ordering overhead films and special views when appropriate;viewing and approving complete set of radiographs;ordering delayed films,follow-up care;recording medical impressions;notifying MD of emergency signs.

List Elements Fully

Performer receives the x-ray requisition form and medical information on a pediatric patient scheduled for intravenous pyelography (IVP: radiography of the kidney and ureter using contrast medium that is introduced through a vein), or excretory urography(covering the entire urinary tract).Requisition may also include orders for inferior vena cavography.

1. Performer reads the patient's requisition form and relevant information to become familiar with the case or to review materials seen earlier (in consultation). Notes patient's age and sex, reasons for ordering the procedure, and suspected conditions. Notes whether a prior study has been done.
   a. Performer reviews relevant medical information and the technique requested by referring MD. Notes whether request is for intravenous injection or infusion, whether purpose of study is evaluation of the kidneys or complete examination of the urinary tract, whether inferior vena cavograms have been ordered for suspected abdominal tumors or as preoperative procedure.
   b. Reviews results of earlier examinations. Views prior radiographs on view boxes and examines problem areas. Notes possible need for

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6. Check here if this is a master sheet..(x)

TASK DESCRIPTION SHEET (continued)

Task Code No. 444

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List Elements Fully

non-standard views depending on the suspected pathology or condition.

c. Checks to see that an authorized adult has signed a consent for the procedure. If not, delays examination until this is done or decides to obtain personally.

d. Performer notes whether patient has any history of allergic reaction to the contrast medium.

e. Notes whether patient has an infectious or communicable condition.

f. Performer notes which preparatory procedures have been ordered and checks whether these have been carried out, such as abstinance from food or having light or liquid breakfast, cleansing enema; checks on any prescribed use of suppository, prior administration of sedation and/or an antihistamine. If not already carried out, performer may order these done or have examination rescheduled as appropriate.

g. Performer notes whether an intravenous drip of saline has been started for infant patient. Orders or decides to do personally if not already started and if infusion is technique to be used.

2. Unless scout film is ready on view box, performer orders scout film and examines on view box when ready.

a. Performer considers whether the scout film adequately demonstrates the areas under study. If not, indicates changes needed in technical factors or patient positioning to technologist, or records on requisition sheet.

b. Performer notes whether feces or barium traces (from earlier study) obstruct view and must be cleared before procedure can be done. If so, performer writes what is needed on requisition form.

List Elements Fully

3. Performer greets patient and any accompanying adult in examination room. Attempts to reassure; explains what will be done. May question adult about patient's symptoms in relation to the condition being studied. May collect additional medical history such as previous radiography, allergies, respiratory problems or asthma. Answers patient's and adult's questions.

Performer may explain or demonstrate use of equipment to a child to allay fears and enlist cooperation.

Performer examines the patient's relevant body structures to determine best location for injection site (such as antecubital vein, vein in foot, or scalp vein). Palpates abdomen to feel for suspected abdominal tumors.

4. Performer considers whether there are contraindications to going ahead with the procedure. May have pediatrician called to discuss patient's current condition and further steps.

a. Performer decides whether to proceed or not based on assessment of patient's current condition, scout film and/or evidence of allergy to contrast medium.

b. If performer decides not to proceed, records reasons and any recommendations on patient's chart. Informs appropriate co-worker of cancellation and has patient returned to room. If appropriate, orders rescheduling of patient or scheduling for alternative procedure.

5. If performer decides to proceed, decides on technique:

TASK DESCRIPTION SHEET (continued)

Task Code No. 444

This is page 3 of 6 for this task.

List Elements Fully

a. Performer decides whether technique will be injection or infusion, whether inferior vena cavography will be done, and, if so,whether to fill and radiograph with one or two projections. Informs staff of decisions.

b. Performer selects the site of the injection or infusion. If scalp vein is to be used, may have patient shaved. For inferior vena cavography selects a vein in one leg, such as small vein in dorsum of foot. Has patient prepared and immobilized or decides to do personally.

c. Performer orders contrast medium in amount determined by the nature of the study desired and the patient's age and body weight. Orders needles of appropriate type and size.

6. When informed that patient and equipment are ready, performer checks whether patient has been properly prepared for the injection or infusion.

   a. Checks that all materials needed and emergency cart are present, that correct drugs and sizes of items are present. Has any needed changes or adjustments made. Checks contrast medium for possible deterioration.
   b. Performer dons sterile gown and gloves when appropriate.

7. Performer may have patient given a carbonated beverage to drink before the beginning of the infusion or injection or immediately afterwards; may administer personally.

8. If the contrast medium is to be injected intravenously, performer has a syringe prepared with the appropriate amount and checks. If the contrast medium is to be infused, performer has IV bottle prepared with appropriate amount of contrast medium and saline solution.

List Elements Fully

9. Performer prepares the entry site (unless an IV has already been started).

   a. Has patient properly immobilized with arm, foot or scalp exposed. Reassures patient.
   b. May elevate foot or arm on a pad. For vein in head, performer may position patient to inflate vein. For vein in arm, performer applies tourniquet. For vein in leg or foot, performer palpates vessel, making sure to locate vein and not artery.
   c. Performer locates point for insertion of needle. Swabs with antiseptic solution.

10. If performer is to proceed with intravenous injection of the contrast solution, performer may inject a small amount of the contrast solution in syringe by palpating vein and inserting needle into vein. Performer pulls back slightly to check for blood;removes any tourniquet,and then injects a small amount of the contrast medium. Leaves needle in place and observes patient for immediate reaction.

11. If performer is to proceed with intravenous infusion of the contrast solution, performer either disconnects IV tubing from saline bottle and connects to prepared IV bottle containing contrast medium, or sets up IV apparatus as follows:

    a. Sets up IV stand near patient. Attaches bottle of prepared contrast solution to sterile IV tubing. Hangs at appropriate height on pole near patient with clamp in closed position.

TASK DESCRIPTION SHEET (continued)

Task Code No. 444

This is page 4 of 6 for this task.

List Elements Fully

b. Prepares patient for insertion of IV needle by exposing vein selected, applying tourniquet, and swabbing site with antiseptic solution.
c. Inserts IV needle with sterile loop attached. May tape needle into position, immobilize limb; removes tourniquet.
d. Runs fluid through tubing to check flow and remove air. Attaches loop of needle to IV tubing.
e. Performer may allow a small amount of the contrast solution to flow in tube as test dose. Reclamps and observes patient for immediate reaction.

12. If patient has a severe reaction to the contrast medium (at any point in the procedure) such as cardiac arrest, anaphylactic shock (exaggerated negative reaction to the foreign substance), bronchospasm or laryngospasm (stricture of bronchial tubes or larynx), hypotension (drop in blood pressure), cyanosis (bluish discoloration due to excessive concentration of reduced hemoglobin in blood), urticaria (vascular skin reaction), or violent sneezing, performer proceeds at once with emergency life support or measures to control the reaction:

a. Performer determines the severity of the condition by listening for heartbeat, respiration; may check blood pressure; may take EKG reading, using equipment on emergency cart.
b. Depending on the symptoms, performer may carry out any or all of the following emergency procedures using equipment on emergency cart:
    i) May administer oxygen or air using oxygen tank and mask or ambu bag; may clear airway using finger or tongue blade.
    ii) May decide to establish an airway by using a laryngoscope(to view larynx) and inserting an endotracheal tube. May perform tracheostomy by cutting opening into trachea and inserting a tube.
    iii) May apply closed chest cardiac massage.
    iv) Depending on EKG results,may apply defibrillator by selecting watt seconds, applying, and raising watt seconds until effective.
    v) Depending on EKG results may administer a prepared intracardial injection of a heart stimulant.
    vi) May decide on and administer IV infusion.
    vii) When patient has been revived, performer reassures patient, records reaction to the contrast medium and what was done on patient's chart. Notifies appropriate medical staff; orders aftercare as appropriate; has patient transported to appropriate location.
    viii) Terminates procedure by notifying appropriate staff.
c. If performer judges that patient displays a strong (but not emergency) allergic reaction:
    i) Performer may order and administer a cortico-steroid or an antihistamine.
    ii) Performer decides whether the reaction is sufficiently controlled to proceed.
    iii) If performer decides to terminate, performer records details of patient's reaction and care on patient's chart and requisition form. Explains to any accompany adult that patient is allergic to the contrast solution (i.e. iodine-based solution). Terminates procedure by notifying appropriate staff.

TASK DESCRIPTION SHEET (continued)

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This is page 5 of 6 for this task.

List Elements Fully

13. If there is no immediate adverse reaction to the preliminary dose, performer continues with the procedure:

    a. With injection, performer injects the full dose slowly. Removes needle. Performer swabs puncture area. Compresses, using gauze, and applies pressure for appropriate amount of time. May cover puncture with bandaid or have this done.
    b. With infusion, performer adjusts flow in tube for rapid drip. Checks on patient while infusion is in progress.

14. With inferior vena cavography, performer proceeds as follows depending on whether AP projection (with patient on back) will be involved or both AP and lateral views (with patient on side) are to be taken:

    a. Performer applies tourniquets around each thigh to allow a concentration of the contrast medium to reach the inferior vena cava all at once, and to decrease the flow of blood from the opposite common iliac vein.
    b. For single view with patient in supine position, performer allows a major portion of the contrast to be injected rapidly into leg vein.
        i) Removes tourniquet on the injected side, and, in a continuous process, injects the remainder of the contrast solution.
        ii) Orders overhead (AP) film.
    c. For multiple views performer first has patient in supine position:
        i) Allows an appropriate portion of of the contrast to be injected rapidly into the leg vein.
        ii) Removes tourniquet on the injected side, and, in a continuous process, injects an appropriate additional amount of the contrast solution.

List Elements Fully

        iii) Orders overhead (AP) film.
        iv) Replaces tourniquet and has patient placed on side for lateral filming.
        v) Repeats partial filling, removal of tourniquet, injection of remainder of contrast dose and overhead filming for second (lateral) projection as described above.

15. After the injection of the contrast solution has been completed, performer orders radiographs at appropriately timed intervals:

    a. Performer specifies which films are to be taken and whether there are to be voiding urethrograms and/or post voiding films. Checks that patient is properly shielded.
    b. If performer decides to order or has request for any non-routine views or variations in the procedure or patient positioning, indicates these to technologist. May write special requests on requisition sheet if not already entered.

16. Performer remains on call in case of delayed reaction during radiographic examination. If there is a delayed serious reaction, performer proceeds with emergency care as described above.

17. Performer looks at inferior vena cavograms and IVP's as each series is processed. Places on view boxes in appropriate sequence. Notes the concentration of the contrast medium.

    a. With inferior vena cavograms notes the extent to which the inferior vena cava is distorted, displaced, or obstructed.
    b. Determines whether the radiographs are technically adequate to demon-

TASK DESCRIPTION SHEET (continued)

Task Code No. 444

This is page 6 of 6 for this task.

List Elements Fully	List Elements Fully
strate the area and condition under study and provide sufficient information to make possible a competent medical interpretation. Performer may ask opinion of another radiologist. c. Performer decides to order additional views, a change in the technical factors, or to introduce additional contrast medium only in extreme circumstances. If so, performer informs technologist of what is needed; may record. Repeats appropriate steps. Performer examines additional radiographs as described above. d. May order immediate food and/or liquid for very young patient. e. Performer decides whether to order delayed radiographs when all the standard series have been reviewed, based on the information already available on the radiographs, the way in which the patient responded to the procedure, the patient's condition, and his or her cumulative exposure. 18. When the performer has determined that the examination has been completed, returns to patient; reassures and removes any IV apparatus and tourniquet. Has subordinates terminate the procedure. Has appropriate sanitary clean up procedures carried out. 19. Records impressions of procedure on patient's chart: a. Preliminary findings. b. How patient tolerated procedure. c. Any special nursing follow-up recommended. d. May sign chart or requisition sheet.	

TASK DESCRIPTION SHEET

Task Code No. 445

This is page 1 of 4 for this task.

1. **What is the output of this task?** (Be sure this is broad enough to be repeatable.)

Decisions made on whether to go ahead with procedure,type and amount of contrast medium to use; procedure explained and pt. reassured;catheterization of pt. arranged;drip of contrast solution,pre-voiding,voiding and post-voiding films ordered;final set of radiographs approved; delayed films and follow-up care ordered; urine obtained and medical impressions recorded; MD informed of emergency signs.

2. **What is used in performing this task?** (Note if only certain items must be used. If there is choice, include everything or the kinds of things chosen among.)

X-ray requisition form and pt.'s chart; scout films; view boxes;prepared sterile procedure tray with materials,syringes,IV bottle and tubing,radiopaque contrast solution,ascending Lipiodol;IV stand;protective lead garments;emergency cart;catheter (already inserted); pen; phone; immobilization devices; pediatric chair; order forms

3. Is there a recipient, respondent or co-worker involved in the task? Yes...(X) No...( )

4. **If "Yes" to q. 3:** Name the kind of recipient, respondent or co-worker involved, with descriptions to indicate the relevant condition; include the kind with whom the performer is not allowed to deal if relevant to knowledge requirements or legal restrictions.

Pediatric pt.to have retrograde cystourethrography; referring MD;attending pediatrician;radiologist;radiologic technologist;nursing and clerical personnel; accompanying adult

5. **Name the task** so that the answers to questions 1-4 are reflected. Underline essential words.

Conducting retrograde voiding cystourethrography of pediatric patient by deciding whether to go ahead; reassuring patient; having patient catheterized; selecting contrast solution; instilling contrast medium through catheter with drip; ordering pre-voiding radiographs; having patient void; ordering voiding and post-voiding radiographs; deciding when examination is completed by viewing radiographs; ordering delayed films; recording medical impressions and needed nursing follow-up; reporting emergency signs to MD.

List Elements Fully

Performer receives the x-ray requisition form and medical information on a pediatric patient scheduled for retrograde voiding cystourethrography (radiography of the bladder and urethra after contrast medium has been introduced through a catheter).

1. Performer reads the patient's requisition form and relevant information to become familiar with the case or to review materials seen earlier (in consultation). Notes patient's age and sex,the reasons for ordering the procedure, and suspected conditions. Notes whether a prior study has been done, such as excretory urography.
    a. Performer reviews relevant medical information and nature of the study requested by referring physician. Notes whether there may be a problem with reflux of urine from bladder into ureters or incomplete emptying of bladder. Reviews results of earlier examinations. Views prior radiographs on view boxes and examines problem areas. Notes possible need for non-standard views depending on the suspected pathology or condition.
    b. Checks to see that an authorized adult has signed a consent for the procedure. If not, delays examination until this is

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6. Check here if this is a master sheet..(x)

TASK DESCRIPTION SHEET (continued)

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List Elements Fully

obtained or decides to obtain personally.

- c. Performer notes whether patient has received any prior medication or sedation.
- d. May call referring physician to discuss or to obtain additional information.

2. Unless already done, performer orders scout films in appropriate positions and examines on view boxes when ready:

   Performer considers whether the scout films adequately demonstrate the organs under study. If not, indicates changes needed in technical factors or patient positioning to technologist, or records on requisition sheet.

3. Performer greets patient and any accompanying adult in examination room. Attempts to reassure; explains what will be done. May question adult about patient's symptoms in relation to the condition being studied. May collect additional medical history. Answers patient's and adult's questions.

4. Performer considers whether there are contraindications to going ahead with the procedure. May have pediatrician called to discuss patient's current condition and further steps.

   - a. Performer decides whether to proceed or not based on assessment of patient's current condition and scout films.
   - b. If performer decides not to proceed, records reasons and any recommendations on patient's chart. Informs appropriate co-worker of cancellation and has patient returned to room. If appropriate, orders rescheduling of patient or scheduling for alternative procedure.

List Elements Fully

5. If performer decides to proceed, and if patient is able to understand, performer explains what will be involved, and that patient will be asked to hold urine or urinate at certain times. Performer may demonstrate the equipment to allay fears and enlist cooperation.

6. Performer decides on the contrast medium to use based on the suspected pathology. May order ascending Lipiodal in addition to contrast medium if patient may have a problem of incomplete emptying of bladder.

   - a. Orders appropriate amount of contrast medium and has this prepared in IV bottle. May have this warmed and shaken. Has bottle hung on IV pole near patient with tubing clamped.
   - b. Performer decides on the size of the catheter to use and orders.
   - c. Performer has patient prepared for the examination;
     - i) Has patient void prior to the examination.
     - ii) Performer may have patient catheterized after voiding or may decide to do personally (or do part of the procedure, such as inflating catheter balloon).
     - iii) May have residual urine collected, measured and prepared for laboratory examination, or may decide to do personally.

7. When informed that the patient and equipment are ready, performer checks that all the materials needed and emergency cart are present.

   - a. Checks amount of contrast material in IV bottle and that it is properly hung near patient.

TASK DESCRIPTION SHEET (continued)

Task Code No. 445

This is page 3 of 4 for this task.

List Elements Fully

List Elements Fully

b. Checks that the patient has been properly immobilized and positioned for the filling of the bladder. Has any needed changes or adjustments made.

c. Performer dons protective lead garments when appropriate. Makes sure persons in the examination room are properly shielded.

8. If performer is to study inadequate bladder emptying, performer may inject an appropriate amount of ascending Lipiodol through the catheter inserted in the patient's bladder.

9. Performer commences the filling of the patient's bladder with the contrast solution:

   a. Runs contrast fluid through IV tubing to check flow and remove air; clamps; attaches catheter to IV tubing, unclamps, and adjusts flow to the desired rate of drip. Reassures patient.

   b. May order radiographs as filling is underway. Examines as soon as processed to check whether there is reflux of the contrast medium.

10. Performer judges when the patient's bladder is full. May have patient report when he or she has the desire to void as an indication. Has catheter clamped off. Records the amount of solution instilled into patient's bladder.

11. Performer orders an overhead radiograph with the patient supine and with the catheter clamped.

12. Performer has equipment prepared for voiding radiographs. May order one quarter format radiographs so that the effect of a multiple changer can be obtained. May specify that ureters are to be visualized if there is a problem of reflux.

13. Performer has patient positioned so that urine can be caught in a bag or receptacle. Has buckey tray positioned so that performer can time exposures from the point that voiding starts(so that the desired number of exposures can be made at appropriate intervals during voiding).

14. Performer removes catheter before voiding by allowing water to flow out of balloon and removing catheter.

15. Performer encourages patient to void. May apply manual pressure to abdomen. Encourages patient to produce a long stream. Indicates to radiologic technologist when to start taking overhead films.

16. As soon as the voiding has been completed, performer orders post-voiding films as required (may include bladder and kidneys). Records the amount of urine obtained or has this done.

17. Performer looks at the series of radiographs on view boxes as soon as they are processed, in appropriate order:

    a. Determines whether the radiographs are technically adequate to demonstrate the area and condition under study and provide sufficient information to make possible a competent medical interpretation.

    b. If incomplete voiding has occurred, performer may request patient to void again as needed. Repeats post-voiding radiography.

    c. Performer may have additional views taken. If so, explains to radiologic technologist what additional

TASK DESCRIPTION SHEET (continued)

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This is page 4 of 4 for this task.

List Elements Fully	List Elements Fully
views are to be taken and reviews these as above. 18. Throughout procedure performer observes patient for signs of adverse reaction to procedure. May decide to provide emergency care. 19. Performer determines whether delayed films are necessary, based on the evidence on the radiographs. Notes especially whether residual urine remains in the bladder following multiple voidings. If delayed films are to be ordered, performer may fill in x-ray requisition sheet and sign. 20. When performer has determined that the examination has been completed, performer returns to patient. Reassures. Informs subordinates that procedure is to be terminated. Has appropriate sanitary clean up procedures carried out. 21. If performer judges that any emergency signs are in evidence, performer notifies patient's physician. Notifies physician of preliminary findings if so requested. 22. Performer may record impressions of procedure on patient's chart: a. Preliminary findings. b. How patient tolerated procedure. c. Any special nursing follow-up recommended and delayed films ordered. d. May sign chart or requisition sheet.	

TASK DESCRIPTION SHEET

Task Code No. 446

This is page 1 of 6 for this task.

1. What is the output of this task? (Be sure this is broad enough to be repeatable.)

Decisions made on whether to go ahead and on technique;syringe filled with contrast material;syringe or catheter inserted and orifice occluded;contrast material injected under fluoroscopic control;spot films taken;overhead films ordered;radiographs assessed;multiple tracts injected and radiographed; complete set of radiographs approved;contrast medium removed if appropriate;medical impressions,follow-up recommendations recorded.

2. What is used in performing this task? (Note if only certain items must be used. If there is choice, include everything or the kinds of things chosen among.)

X-ray requisition form and pt.'s medical chart; pen; scout film;view boxes;sterile tray with sterile towels,antiseptic and sterile solutions,gloves,swabs, lubricant,syringes,catheters,blunt needle or conical nozzle,gauze or millipore filter,butterfly sutures, tape,scissors,water soluble or iodized oil contrast; tilt table;fluoroscope,spot film device,TV monitor; sterile gown,gloves;protective lead shielding;receptacle;clamp;lead markers;emergency cart

3. Is there a recipient, respondent or co-worker involved in the task? Yes...(x) No...( )

4. If "Yes" to q. 3: Name the kind of recipient, respondent or co-worker involved, with descriptions to indicate the relevant condition; include the kind with whom the performer is not allowed to deal if relevant to knowledge requirements or legal restrictions.

Any pt. to have radiography of external fistula;accompanying adult;referring MD;radiologic technologist;nursing personnel

5. Name the task so that the answers to questions 1-4 are reflected. Underline essential words.

Conducting radiography of external fistula or sinus tract of any pt. by deciding whether to go ahead;examining;deciding on technique;inserting and/or attaching syringe or catheter for injection of contrast medium using sterile procedure;fitting to occlude orifice;injecting contrast medium into tract under fluoroscopic control;spot filming sequentially;ordering overhead films;assessing radiographs and deciding on double contrast;injecting multiple tracts;deciding when examination is complete by viewing radiographs;removing contrast material;recording medical impressions,needed nursing follow-up

List Elements Fully

Performer receives the x-ray requisition form and medical information for a patient scheduled for radiography of any external fistula or sinus tract including wounds and external fistulas not covered by regular special procedures.(Includes abnormal tracts leading from a mucous membrane to the skin or from the skin to a deep seated focus of suppuration (pus formation).)

1. Performer reviews the patient's requisition form and relevant medical information to become familiar with the case or to review material seen earlier.

Performer notes the patient's age and sex and the nature of the occurrence of the sinus tract or fistula,including the surrounding circumstances. Performer may have referring physician called and discusses case.

Performer reviews any current radiographs to become familiar with evidence on the location of the fistula or sinus tract and any information on the number of openings. Examines radiographs on view boxes. Notes any orders on pre-examination procedures to be carried out by patient at home or in hospital; checks whether these have been followed. Notes whether any sedation or analgesic prescribed has been administered and when. Notes any recommendations on technique. Notes

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6. Check here if this is a master sheet..(X)

TASK DESCRIPTION SHEET (continued)

Task Code No. 446

This is page 2 of 6 for this task.

List Elements Fully

records on how patient tolerated any previous radiographic studies; notes whether patient has history of allergy to iodine based contrast medium. Notes whether female may be pregnant, whether patient has an infectious or communicable condition, and any other relevant medical information such as infection, anomalies, or inflammation at the site of the opening(s). Notes results of any recent lab tests.

If orders for any prior procedures have not been carried out, performer arranges to have them done or has procedure rescheduled.

Checks to see that patient or an authorized adult has signed consent for procedure. If not signed, postpones procedure until a consent is obtained or decides to obtain personally.

2. Performer greets any non-infant patient and/or accompanying adult in examination room. Attempts to reassure and explains what will be done. Indicates whether the procedure may be painful. Attempts to alleviate fears and develop confidence. Indicates how patient or adult can cooperate. Answers questions.

   a. Performer may question patient or adult about symptoms in relation to the condition being studied. May collect additional medical history; determines whether female patient of reproductive age may be pregnant.
   b. If appropriate, performer may request that patient or authorized adult sign consent form for the procedure. Explains the dangers of the procedure and the contingencies involved. (Does not proceed unless there is a consent for procedure.)
   c. Performer may decide to examine patient. If so, has patient placed or lie on examination table in position appropriate for examination of the fistula or sinus tract. Performer examines the opening(s) of the fistula or sinus tract; notes whether there is swelling, tenderness, inflamation, and drainage of pus or other secretion. Notes number of openings which may be involved.
   d. Performer checks that the patient is properly shielded and orders a scout film of the area under study.

   Performer views scout film on view box. Evaluates whether the technical factors and patient position are appropriate to produce satisfactory radiographs. If not, indicates to technologist what adjustments are needed.

   Performer also notes the appearance of the organs involved and whether there is obstruction by gas, feces or overlying organs. If so, performer indicates what is needed, if anything.

3. Performer considers whether there have been changes in the patient's condition since the decision was made to do the procedure that are contraindications to going ahead. May have specialist or clinician called; discusses patient's current condition. Decides whether to proceed or not based on assessment of patient's current condition and any discussion.

   If the decision is not to proceed, may record reasons and any recommendations on patient's chart. If appropriate, orders rescheduling of patient or scheduling for alternative procedure.

4. If the decision is to proceed, performer makes final decision on the contrast medium to use (air, water soluble solution or iodized oil). Decides

TASK DESCRIPTION SHEET (continued)

Task Code No. 446

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on the technique to use to fill the tract with contrast and occlude the orifice of the tract such as (a) syringe with plugged needle or cone terminal, (b) syringe with thin Teflon or polyethylene catheter, and (c) simple or bulb catheter. Performer considers the size of the openings, the suspected distance of the primary site from the orifice, the number of openings, and the location of the sinus or fistula. Performer may decide to use butterfly sutures to hold catheter in place.

Performer informs appropriate co-workers of decisions; order materials and has patient, materials and equipment prepared. Has technical factors set for fluoroscopy. If spot filming equipment uses cassettes, has cassette inserted. Chooses full, half, or quarter format and sets as appropriate. (If roll film attachment, checks that attachment is loaded with film or has this done.)

Performer dons protective lead garments and sterile gown, mask, and gloves when appropriate.

5. When informed that patient and equipment are ready, performer checks whether patient has been properly prepared.

   a. Checks that all materials needed are present, that emergency cart is present.
   b. Checks that patient has been properly shielded, immobilized, and positioned on x-ray table. May decide to immobilize personally.
   c. Has any needed changes or adjustments made.
   d. Checks that anyone remaining in room is properly shielded.

6. Performer has the orifice(s) to be entered and the surrounding tissues cleansed with antiseptic solution or

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decides to do this personally. Ensures that sterile procedures are followed throughout procedure.

7. Performer prepares syringe with contrast medium:

   a. With iodized oil, may have this heated to appropriate temperature.
   b. With water soluble contrast or iodized oil, performer fills sterile syringe by ejecting air and drawing up appropriate amount of the medium into syringe.
   c. With air contrast, performer places sterile gauze or millipore filter on tip of empty sterile syringe and pulls back until proper amount of air has entered.
   d. Lays prepared syringe on sterile tray.

8. If a syringe with a plugged needle or cone terminal is to be used, performer attaches a blunt conical nozzle or blunt needle to the syringe. Inserts the syringe in the orifice so that the nozzle or hub of the syringe will effectively occlude the orifice without backflow from the external opening after the contrast is injected.

9. If a syringe with a thin Teflon or polyethylene catheter is to be used, performer secures a sterile catheter to the syringe by means of an adaptor if necessary:

   a. The performer gently probes the extent of the sinus tract or fistula by advancing the catheter as far as it will travel. Performer may check that the catheter is not lodged in a blind pocket by moving the catheter in several directions until the catheter has entered to its maximum extent.

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b. The performer may note the presence of several tracts with a common orifice. If so,explores all the tracts. Performer may decide to inject contrast in all the tracts by catheterizing sequentially.
c. Once the catheter is in place, performer makes sure that the orifice is properly occluded.

10. If a bulb catheter is to be used, performer has sterile catheter checked for defects. Performer inserts catheter gently using sterile procedure:

    a. Picks up appropriate size catheter and lubricates it with sterile lubricant. May clamp off the drainage lumen.
    b. Inserts lubricated tip in orifice with gentle, steady pressure for appropriate distance. Allows any draining fluid to flow out into receptacle through catheter.
    c. Performer attaches syringe with air or sterile water to balloon lumen and inflates the catheter balloon (which inflates inside orifice).
    d. Performer checks that amount of air or water in the balloon is sufficient to provide a snug fit and hold the catheter in place without a backflow of the contrast medium. Gently tugs the catheter to see if it is secure. Performer adjusts the amount of air or water in the balloon until this is accomplished.
    e. When catheter is being held in place performer clamps off the lumen and disconnects the syringe. Inserts a self-sealing device in balloon lumen if available. Performer attaches syringe with contrast medium to the catheter.

11. If performer decides to suture the catheter in place after it has been inserted, performer uses sterile "butterfly" sutures. Places these so that they adhere to catheter and the outside skin of the orifice, thus occluding the orifice.

12. When the syringe containing the air or contrast solution is attached to the catheter or held in place at the opening of the orifice, performer prepares to inject the contrast medium under fluoroscopic control:

    a. Performer positions the overhead fluoroscope unit over the patient and positions patient so that the area under study will be shown most effectively on the TV monitor. Performer may have lights in room dimmed. Activates fluoroscope. Performer adjusts unit until the opening of the fistula or sinus tract is visible on the TV monitor.
    b. Performer slowly injects the contrast medium from the syringe into the tract (through the catheter if one is in use). Maintains enough pressure to distend the cavity.
    c. Performer observes the filling on the TV monitor and takes sequential spot films during the filling. Activates spot film attachment and x-ray foot pedal as appropriate. If cassette attachment, may have technologist remove cassette as spots are snapped and insert additional cassettes, or does so personally.
    d. Performer continues to fill the cavity and observe on the TV monitor. Performer may move the patient on the table, the table, or the fluoroscope unit to obtain appropriate projections. Performer continues with filling and spot filming until the structures and the origin of the tract are delineated. Determines when fluoroscopy is completed.

TASK DESCRIPTION SHEET (continued)

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e. Performer may order overhead film(s). If so, indicates to radiologic technologist what views to take.

13. Performer has initial spot films and radiographs processed at once and has them placed in sequence on view boxes as soon as they are ready:

   a. Performer checks for technical quality, and notes whether there is any need to adjust technical factors or have the patient's position adjusted. Determines whether the radiographs are technically adequate to demonstrate the area and condition under study and provide sufficient information to make possible a competent medical interpretation.
   b. Performer notes whether filling of the tract is adequate, whether there is need to inject additional contrast. Performer decides whether to reinject and repeat some views, reinject and take additional views. If appropriate, decides whether to inject into additional tracts or openings. May decide to reinject with air to obtain double contrast radiographs after use of positive contrast material.
   c. If performer decides to reinject, repeats appropriate steps including spot filming. May order overhead films after fluoroscopy as appropriate.
   d. If performer decides to inject in other openings or tracts leading from a single opening, performer repeats catheterization and injection steps as appropriate; retains the catheters used for each orifice to mark the tracts. Performer may have multiple orifices marked with lead numbers for later identification on the radiographs.
   e. If performer decides on a double contrast study, performer may remove the positive contrast medium (such as iodized oil) as described in step 16. Reinjects with air using air-filled syringe as described above.
   f. Performer evaluates later spot films and radiographs as described above. Repeats appropriate steps.

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14. Throughout the procedure the performer remains alert for possible adverse reactions to the procedure. May decide to provide emergency care.

15. Performer decides and indicates to radiologic technologist when the radiographic examination is completed. May decide to order delayed films. If so, may fill out requisition sheet and sign.

16. If the contrast material requires removal, performer returns to the patient:

   a. Reassures and explains what will happen.
   b. Performer attaches empty syringe to each injection catheter (or inserts in each orifice) sequentially.
   c. Performer raises the inclination of the table and pulls back on the syringe plunger so that the contrast medium drains out by gravity and aspiration. Performer may note progress by looking at the image of the medium on the TV monitor. Performer determines when the medium has been appropriately removed.

17. Performer gently removes any "butterfly" sutures and any catheters inserted. Indicates that procedure has been completed. Has appropriate sanitary clean up procedures carried out.

TASK DESCRIPTION SHEET (continued)

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List Elements Fully	List Elements Fully
18. If performer judges that any emergency signs are in evidence, performer notifies patient's physician at once. If so requested, may report results at once to referring physician. 19. Performer may record impressions of procedure on patient's chart: a. Preliminary findings. b. How patient tolerated procedure. c. Any special nursing follow-up recommended. d. May sign chart or requisition sheet.	

TASK DESCRIPTION SHEET

Task Code No. 447

This is page 1 of 5 for this task.

1. What is the output of this task? (Be sure this is broad enough to be repeatable.)

Decisions made on whether to go ahead, and on technique; syringe filled with contrast material; syringe or catheter inserted and orifice occluded; contrast material injected under fluoroscopic control; spot films taken; overhead films ordered; radiographs assessed; multiple openings injected and radiographed; complete set of radiographs approved; contrast medium removed if appropriate; medical impressions, follow-up recommendations recorded.

2. What is used in performing this task? (Note if only certain items must be used. If there is choice, include everything or the kinds of things chosen among.)

X-ray requisition form and pt.'s medical chart; pen; scout film; view boxes; sterile tray with sterile towels, antiseptic and sterile solutions, gloves, swabs, lubricant, syringes, catheters, adaptor, conical nozzle, gauze or millipore filter; emergency cart; water soluble or iodized oil contrast; tilt table; fluoroscope with spot film device and TV monitor; sterile garments, protective lead garments; shielding; lead markers

3. Is there a recipient, respondent or co-worker involved in the task? Yes...(X) No...( )

4. If "Yes" to q. 3: Name the kind of recipient, respondent or co-worker involved, with descriptions to indicate the relevant condition; include the kind with whom the performer is not allowed to deal if relevant to knowledge requirements or legal restrictions.

Any pediatric patient with intersex condition; accompanying adult; referring MD; pediatrician; radiologic technologist; nursing personnel

5. Name the task so that the answers to questions 1-4 are reflected. Underline essential words.

Conducting vaginography of pediatric pt. for intersex condition by deciding whether to go ahead; examining; deciding on technique; inserting and/or attaching syringe or catheter for injection of contrast medium using sterile procedures; injecting contrast medium into opening(s) under fluoroscopic control; spot filming sequentially and ordering overhead films; assessing radiographs and deciding on double contrast, injection of multiple openings; deciding when examination is complete by viewing radiographs; removing contrast material; recording medical impressions and needed nursing follow-up.

List Elements Fully

Performer receives the x-ray requisition form and medical information for a pediatric patient scheduled for vaginography in connection with an intersex condition (having one or more contradictions of the morphological criteria of sex) and ambiguity of anatomical structures.

1. Performer reviews the patient's requisition form and relevant medical information to become familiar with the case or to review material seen earlier.
   a. Performer reviews any clinical information relevant to the case. Performer studies any current radiographs on view boxes. Performer notes patient's age and any information on the patient's anatomical structures and orifices in the genital area.
   b. Notes any recommendations made on technique. Notes whether patient has a communicable condition and any other relevant medical information such as infection or inflammation in the genital area. Notes results of any recent lab tests.
   c. Checks to see that an authorized adult has signed consent for procedure. If not, postpones procedure until a consent is obtained or decides to obtain personally.

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6. Check here if this is a master sheet..(X)

TASK DESCRIPTION SHEET (continued)

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2. Performer greets any non-infant patient and/or accompanying adult in examination room. Attempts to reassure and explains what will be done. Attempts to alleviate fears and develop confidence. Indicates how patient or adult can cooperate. Answers questions.

   a. Performer may question patient or adult about symptoms in relation to the condition being studied. May collect additional medical history.
   b. Performer makes sure that all individuals to be in contact with a neonate patient are following proper sanitary procedures. Dons lead protective garments and sterile gown, mask, and gloves when appropriate.
   c. If appropriate, performer may request that authorized adult sign consent form for the procedure. (Does not proceed unless there is a consent for procedure.)

3. Performer proceeds with preliminary examination of patient:

   a. Has patient placed and positioned on examination table with genital area exposed.
   b. Using sterile technique, performer examines the genital area and explores any openings that are evident. Performer considers which of the openings should be injected with contrast medium to visualize the internal structures.
   c. Notes whether there is swelling, tenderness, inflamation, and drainage of pus or other secretion at any of the openings.
   d. Performer orders scout film of the genital area. Examines on view box when ready. Performer evaluates whether the technical factors and patient position used have produced satisfactory radiograph. If not, indicates to technologist what changes are needed.

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   e. Performer also notes the appearance of the organs involved and whether there is obstruction by gas, feces or overlying organs. If so, indicates what should be done to correct, if anything.

4. Performer considers whether there have been changes in the patient's condition since the decision was made to do the procedure that are contraindications to going ahead. May have pediatrician or clinician called; discusses patient's current condition. Decides whether to proceed or not based on assessment of patient's current condition and any discussion.

   If the decision is not to proceed, may record reasons and any recommendations on patient's chart. If appropriate, orders rescheduling of patient or scheduling for alternative procedure.

5. If the decision is to proceed, performer makes final decision on the contrast medium (water soluble or oil). Performer determines whether to inject more than one opening simultaneously or sequentially. Decides on technique to use to inject, depending on the size of the orifice(s). Chooses syringe with hub or cone terminal, or thin polyethylene catheter, possibly equipped with adaptor. Chooses appropriate sizes for the materials.

6. Performer informs appropriate co-workers of decisions; has patient, materials and equipment prepared. Has technical factors set for fluoroscopy. If spot filming equipment uses cassettes, has cassette inserted. Chooses full, half, or quarter format and sets as appropriate. (If roll film attachment, checks that attachment is loaded with film or has this done.)

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7. When informed that patient and equipment are ready, performer checks whether patient has been properly prepared:

   a. Checks that all materials needed are present, that emergency cart is present.
   b. Checks that patient has been properly shielded, immobilized, and positioned on x-ray table. May decide to immobilize personally.
   c. Has any needed changes or adjustments made.Checks for shielding of staff.
   d. Reassures or comforts patient.

8. Performer has the orifice(s) to be entered and the surrounding tissues cleansed with antiseptic solution or decides to do this personally. Ensures that sterile procedures are followed throughout procedure.

9. Performer prepares syringe with contrast medium. Performer fills sterile syringe by ejecting air and drawing up appropriate amount of the medium into syringe. Lays prepared syringe on sterile tray.

10. If a syringe with cone terminal is to be used, performer attaches a blunt conical nozzle to the syringe and inserts the syringe into the orifice so that the nozzle or hub of the syringe will effectively occlude the orifice without backflow from the external opening after the contrast is injected.

11. If a syringe with a thin Teflon or polyethylene catheter is to be used, performer secures a sterile catheter to the syringe by means of an adaptor.

   a. Applies sterile lubricant to tip if necessary.
   b. The performer gently probes the extent of the opening by advancing the catheter as far as it will travel easily. If performer thinks that the catheter is lodged in a blind pocket, moves the catheter in several directions until the catheter has been entered to its maximum extent. May decide to opacify.
   c. The performer may note the presence of several tracts with a common orifice. If so, explores all the tracts. Performer may decide to inject contrast in all the tracts by catheterizing sequentially.
   d. Once the catheter is in place, performer makes sure that the orifice is properly occluded.

12. When the syringe containing the contrast solution is attached to the catheter or held in place at the opening of the orifice, performer prepares to inject the contrast medium under fluoroscopic control:

   a. Performer positions the overhead fluoroscope unit over the patient and positions patient so that the area under study will be shown most effectively on the TV monitor. Performer may have lights in room dimmed. Activates fluoroscope. Performer adjusts unit until the opening (and catheter) is visible on the TV monitor.
   b. Performer slowly injects the contrast medium from the syringe into the tract (through the catheter if one is in use). Maintains enough pressure to distend the cavity.
   c. Performer observes the filling on the TV monitor and takes sequential spot films during the filling. Activates spot film attachment and x-ray foot pedal as appropriate. If cassette attachment, may have technologist remove cassette as spots are snapped and insert additional cassettes, or does so personally.

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d. Performer continues to fill the cavity and observe on the TV monitor. Performer may move the patient on the table, the table, or the fluoroscope unit to obtain appropriate projections. Performer continues with filling and spot filming until the internal structures are delineated.

e. Performer may order overhead film(s). If so, indicates to radiologic technologist what views to take.

13. Performer has initial spot films and radiographs processed at once and has them placed in sequence on view boxes as soon as they are ready:

a. Performer checks for technical quality, and notes whether there is any need to adjust technical factors or have the patient's position adjusted. Determines whether the radiographs are technically adequate to demonstrate the organs under study and provide sufficient information to make possible a competent medical interpretation.

b. Performer notes whether the internal structures have been properly delineated, whether there is evidence that the contrast solution has not provided adequate filling, whether there is need to inject additional contrast. Performer decides whether to reinject and repeat some views and/or take additional projections.

c. If the performer will inject additional openings, performer decides whether to leave any catheter already inserted in place and catheterize another orifice or whether to catheterize and inject sequentially.

d. If performer decides to reinject, repeats appropriate steps including spot filming. May order overhead films after fluoroscopy as appropriate.

e. If performer decides to inject in other openings or tracts leading from a single opening, performer repeats catheterization and injection steps as appropriate; retains the catheters used for each orifice to mark the tracts (or removes each catheter after radiographing before the next orifice is injected, as decided). Repeats appropriate steps as described above.

Performer may have multiple orifices marked with lead numbers for later identification on the radiographs.

f. Performer evaluates later spot films and radiographs as described above. Repeats appropriate steps until satisfied that there is sufficient information on the patient's genital structures.

14. Throughout the procedure the performer remains alert for possible adverse reactions to the procedure. May decide to provide emergency care.

15. Performer decides and indicates to radiologic technologist when the radiographic examination is complete.

16. If the contrast material requires removal, performer returns to the patient and comforts or reassures:

a. Performer attaches empty syringe to each injection catheter (or inserts in each orifice) sequentially.

b. Performer adjusts the inclination of the table and pulls back on the syringe plunger so that the contrast medium drains out by gravity

TASK DESCRIPTION SHEET (continued)

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and aspiration. Performer may note progress by looking at the image of the medium on the TV monitor. Performer determines when the medium has been appropriately removed. 17. Performer gently removes any catheters inserted. Indicates that procedure has been completed; orders appropriate sanitary clean up procedures. Sees that patient is allowed to void if appropriate. 18. If performer judges that any emergency signs are in evidence, performer notifies patient's physician at once. If so requested, may report results at once to referring physician. 19. Performer may record impressions of procedure on patient's chart: a. Preliminary findings. b. How patient tolerated procedure. c. Any special nursing follow-up recommended. d. May sign chart or requisition sheet.	

TASK DESCRIPTION SHEET

Task Code No. 448

This is page 1 of 5 for this task.

1. What is the output of this task? (Be sure this is broad enough to be repeatable.)

Decision made on whether to go ahead with procedure; patient examined and decisions made on technique; patient explained procedure, reassured; contrast solution injected transabdominally into peritoneum and patient moved to distribute contrast; radiographs ordered and assessed; decision made on delayed films and excretory urography; complete set of films approved; medical impressions, orders, follow-up care recorded; MD notified of emergency signs.

2. What is used in performing this task? (Note if only certain items must be used. If there is choice, include everything or the kinds of things chosen among.)

X-ray requisition form and pt.'s chart;prior radiographs;view boxes;sterile tray with antiseptic solution,swabs,dressings,iodine based contrast solution, saline,puncture needles,tube extension,syringes; emergency cart and materials;protective lead garments;sterile gown,gloves;immobilization devices; shielding;fluoroscope and TV monitor;sedative;antihistamine;telephone;pen;specimen container

3. Is there a recipient, respondent or co-worker involved in the task? Yes...(X) No...( )

4. If "Yes" to q. 3: Name the kind of recipient, respondent or co-worker involved, with descriptions to indicate the relevant condition; include the kind with whom the performer is not allowed to deal if relevant to knowledge requirements or legal restrictions.

Pediatric pt. to have peritoneography;accompanying adult;referring MD;radiologist; radiologic technologist;nursing staff

5. Name the task so that the answers to questions 1-4 are reflected. Underline essential words.

Conducting percutaneous peritoneography/inguinal herniography of pediatric patient by deciding whether to go ahead;reassuring and examining patient;deciding on technique; instilling iodine based contrast solution transabdominally after checking needle placement;having patient moved to distribute contrast;ordering and assessing delayed films;ordering excretory urography if appropriate; deciding when examination is completed;recording orders, medical impressions, and nursing follow-up; notifying MD of emergency signs.

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Performer receives the x-ray requisition form and medical information on a pediatric patient scheduled for positive contrast inguinal herniography/peritoneography (radiography of the contents of the abdominal peritoneum after injection of contrast medium). Requisition may also include orders for excretory urography.

1. Performer reads the patient's requisition form and relevant information to become familiar with the case or to review materials seen earlier (in consultation). Notes reasons for ordering the procedure and suspected conditions. Notes patient's age, sex, and weight.

   a. Performer notes relevant medical information and the nature of the suspected pathology, such as bilateral or unilateral inguinal hernia, patent vaginal processes, hydroceles, intraperitoneal masses, or cryptorchidism (undescended testes). In the latter case, notes whether peritoneography is to be followed by excretory urography.

   b. Performer notes recommendations on technique, reports on earlier examinations. Views prior radiographs on view boxes and examines problem areas. Notes possible need for non-standard views depend-

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6. Check here if this is a master sheet..(X)

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ing on the suspected pathology or condition.

c. Checks to see that an authorized adult has signed a consent for the procedure. If not, delays examination until this is done or decides to obtain personally.

d. Performer notes whether patient has any history of allergic reaction to the contrast medium or has other conditions which are contraindications to procedure, such as retention of urine, peritonitis, dilated bowel, peritoneal adhesions, an intraperitoneal shunt tube, bleeding diathesis, or abdominal wall infection.

e. Notes whether patient has an infectious or communicable condition.

f. Performer notes which preparatory procedures have been ordered and checks whether these have been carried out, such as prior abstinence from food or light meal, cleansing enema, prior administration of a sedative or an antihistamine. If not already carried out, performer may have these done or have examination rescheduled as appropriate.

2. Performer greets patient and any accompanying adult in examination room. Attempts to reassure; explains what will be done. May question adult about patient's symptoms in relation to the condition being studied. May collect additional medical history such as previous radiography, allergies, respiratory problems or asthma. Answers patient's and adult's questions.

Performer may explain or demonstrate use of equipment to a child to allay fears and enlist cooperation. Explains that patient will be asked to hold still from time to time.

Performer examines the patient to assess relative obesity (to determine appropriate needle length). May palpate abdomen to feel for hernia and whether bowel is in hernia sac. If appropriate, explains procedure to authorized adult and obtains written consent; does not proceed without consent.

3. Performer orders scout film and views when ready:

   a. Inspects scout film; reviews appearance of the area of interest and determines whether the technical quality of the film is adequate.
   b. Performer indicates the needed adjustments to technologist in patient position or in technique.

4. Performer considers whether there are contraindications to going ahead with the procedure. May call referring physician and discuss patient's current condition and further steps.

   a. Performer decides whether to proceed or not based on assessment of patient's current condition, evidence of allergy to contrast medium, the scout film and contraindications.
   b. If performer decides not to proceed, records reasons and any recommendations on patient's chart. Informs appropriate co-workers of cancellation and has patient returned to room. If appropriate, orders rescheduling or scheduling for alternative procedure.

5. If performer decides to proceed, makes final decisions on technique:

   a. Performer indicates to technologist appropriate size and length of needle depending on patient's size and obesity. Indicates the contrast medium (iodine based, water soluble solution). Chooses the amount based

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on the patient's weight. Indicates whether a tube extension will be used with the puncture needle. Indicates puncture site (approximately at the midline, near umbilicus).

b. Has patient and materials prepared for procedure. Performer arranges to have patient urinate if possible immediately prior to procedure.

6. When informed that patient and equipment are ready, performer checks whether patient has been properly immobilized and prepared for the injection:

   a. Checks that all materials needed and emergency cart are present,that correct drugs and sizes of items are present.
   b. Checks that patient and others in the room have been properly shielded. May decide to immobilize patient personally.
   c. Performer has any needed changes or adjustments made.
   d. Performer has technical factors set for fluoroscopy.
   e. Dons protective lead garments and sterile gown and gloves when appropriate.

7. Performer has patient's abdomen swabbed with antiseptic solution or does so personally. Covers areas surrounding injection site with sterile towels.

8. Performer fills a syringe with the iodine based, aqueous contrast solution selected, checking that quantity is correct; checks prepared syringe. Lays on tray.

9. Performer asks patient to hold breath and inserts the puncture needle into entry site (about 2 to 3 cm. below the umbilicus). Performer negotiates the needle through the skin, fascia, and muscle, sensing the needle as it penetrates the abdominal wall until there is a sudden "give" when the needle enters the peritoneal cavity. Performer may direct the needle to an appropriate angle towards the pelvis.

   a. Performer withdraws the inner part of the needle; may attach a sterile rubber tube extension to the protruding end of the needle.
   b. Performer attaches an empty sterile syringe to the rubber tube extension or needle and aspirates as a check on the position of the needle.
   c. If the performer aspirates urine (bladder) or air (bowels), performer removes the needle and attempts an entry at a slightly higher or lower site as decided. Repeats as needed until satisfied.
   d. If no air or urine is aspirated, performer moves the needle tip gently from side to side to assure that needle has not entered a solid abdominal organ or retroperitoneal tissues.
   e. If a solid organ or tissues are encountered, performer partly withdraws and repositions needle as needed until satisfied.
   f. If performer aspirates peritoneal fluid, may decide to have sample prepared for laboratory (if not already done). Aspirates sample; removes syringe and ejects fluid into sterile container. Has container capped, properly labeled, and sent to lab for testing. Records if appropriate.
   g. If warranted, may position fluoroscope unit over patient to check position of needle. Activates flu-

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oroscope and views needle placement on TV monitor. Adjusts needle until satisfied of correct placement.

10. When the performer is satisfied that the needle is in the peritoneal cavity, performer removes the syringe used for aspiration and attaches syringe with contrast solution to the tube extension or needle.

    a. Performer injects the contrast solution slowly. Notes any visual evidence in patient's abdominal musculature of inadvertant infiltration of contrast material.
    b. Performer may decide that it is necessary to observe the filling on TV monitor to make sure that the contrast is entering cavity. If so, retains gonadal shielding; activates fluoroscope and observes initial progress of the contrast solution on TV monitor. Shuts fluoroscope as soon as adequate check has been made.
    c. Throughout procedure performer remains alert to patient's condition. Notes any indication of adverse reactions to the procedure. May decide to provide emergency care.

11. Once the contrast medium has been fully injected, performer has patient hold still; gently removes needle. Swabs area with antiseptic. Decides on sterile dressing and orders, or applies personally.

12. If performer has determined (in manual examination) that there is bowel contained in a hernia sac, performer manually restores the bowel to its normal place by gently kneading bowel into place.

13. Performer has the patient turned to a prone position on the x-ray table. Has the patient rocked gently from side to

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side to facilitate outlining of anterior surface of the peritoneum by contrast material. Reassures patient.

14. Performer has the table raised at head to 35° to permit the contrast material to flow down over the internal inquinal rings.

15. After an elapse of several minutes after instillation, performer orders a single posteroanterior radiograph of the pelvis and upper thighs without shielding. Has radiograph processed at once.

16. Performer views radiograph on view box when ready:

    a. Performer considers whether the inguinal areas on both sides are satisfactorily delineated by the contrast material. Considers whether the technique is satisfactory, whether the position of the patient is correct, and whether the view needed is obscured in any way.
    b. If the radiograph is not satisfactory, performer indicates the needed changes in technique or in the patient's position. May have the patient rocked onto a side that is not sufficiently delineated and then back to the prone position. Orders second radiograph as soon as possible before absorption of the contrast material from the peritoneum. Reviews and/or repeats until performer is satisfied that radiograph adequately demonstrates the area under study.

17. Performer has patient taken to a waiting or other designated area. Has patient encouraged to move and play actively for about a half hour to an

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hour and then has patient returned to the examination room. Orders an antero-posterior radiograph of the abdomen with gonadal shielding.

18. Performer looks at the delayed radiograph as soon as it is processed, together with the first one(s) processed:

    a. Determines whether the peritoneograms are technically adequate to demonstrate the area and condition under study and provide sufficient information to make possible a competent medical interpretation. May discuss with another radiologist.
    b. Performer may decide to order additional views such as oblique projections of kidney. Evaluates whether there is a need for such additional exposure and whether sufficient contrast material remains unabsorbed to provide for adequate films. Indicates orders to radiologic technologist or writes out requisition form if so decided.
    c. If excretory urography is to follow, (such as for cryptorchidism) performer specifies what views are to be taken. May order voiding urethrograms and/or post voiding films. Indicates appropriate patient shielding.
    d. May order immediate food and/or liquid for patient.

19. When performer has determined that the examination has been completed, informs subordinates. Has appropriate sanitary clean up procedures carried out.

    If performer judges that any emergency signs are in evidence, performer notifies patient's physician at once. If so requested, may report results at once to referring physician.

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20. Records impressions of procedure on patient's chart:

    a. Preliminary findings.
    b. How patient tolerated procedure.
    c. Any special nursing follow-up recommended, delayed films ordered.
    d. May sign chart or requisition sheet.

TASK DESCRIPTION SHEET

Task Code No. 449

This is page 1 of 3 for this task.

1. What is the output of this task? (Be sure this is broad enough to be repeatable.)

Patient's skeletal age determined and normality of bone maturation assessed; recommendations made for further study; report written or dictated.

2. What is used in performing this task? (Note if only certain items must be used. If there is choice, include everything or the kinds of things chosen among.)

Patient's x-ray requisition forms and related medical information, current and serial skeletal radiographs; view boxes; bone-age atlas reference volumes, related charts; dictation equipment or report forms; pen; phone

3. Is there a recipient, respondent or co-worker involved in the task? Yes...(X) No...( )

4. If "Yes" to q. 3: Name the kind of recipient, respondent or co-worker involved, with descriptions to indicate the relevant condition; include the kind with whom the performer is not allowed to deal if relevant to knowledge requirements or legal restrictions.

Pediatric radiologist; referring MD

5. Name the task so that the answers to questions 1-4 are reflected. Underline essential words.

Reading and interpreting radiographs for bone-age study by comparing radiographs of bone with standard maturity indicators in atlas of age-of-appearance standards by sex; referring to current and/or serial radiographs; evaluating by use of age standards of a single body region, counting ossification centers, or by sampling-of-centers technique; assessing normality of bone maturation based on normal ranges; preparing report of assessment including recommendations on additional studies if warranted.

List Elements Fully

Performer receives the x-ray requisition form and processed radiographs of a bone age study (radiograph(s) of selected ossification center(s) for the purpose of assessing skeletal age - bone maturation), or obtains jacketed radiographic work-ups.

1. Performer reads the x-ray requisition form for bone age study.
   a. Performer postpones informing himself or herself of the patient's age or height to ensure an objective assessment.
   b. Notes whether the study is for a routine screening involving a posteroanterior view of a hand and wrist, or a sampling of views of several ossification centers for more detailed analysis involving a specific problem. Notes any special views ordered by referring physician.
   c. Notes whether the radiographs are part of a series (over time) for the patient. If so, makes sure that the entire series are available for review.

2. Performer assembles the appropriate atlas references, charts, and forms used for analysis of the patient's bone age. Places current radiographs on view boxes.

3. If the performer is evaluating a hand and wrist projec-

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6. Check here if this is a master sheet..(X)

TASK DESCRIPTION SHEET (continued)

Task Code No. 449

This is page 2 of 3 for this task.

List Elements Fully

tion for a routine screening, performer proceeds as follows:

a. Performer studies the radiograph of the patient's hand and wrist and determines what maturity indicators are in evidence (those features of the individual bones shown in the radiograph which, because they occur in a regular order, mark the process of skeletal maturation).
b. Performer compares the maturation indicators with a standard set of plates of radiographs for that center (hand and wrist) by sex, as listed in a standard reference atlas.
c. Performer notes the absence or presence of each maturity indicator and determines the approximate age at which the indicator appears on the standard plates for the appropriate sex.
d. Performer reaches an overall impression of the patient's bone age through comparison with the atlas standards. Evaluates all of the individual bones and estimates bone age based on the individual assessments. Notes any marked difference in maturity between carpals and long bones.
e. At appropriate point in evaluation performer reviews patient's relevant medical history, age and height.
f. Performer determines whether the patient's estimated bone age is normal, advanced, or retarded by comparing the patient's chronological age with the estimated bone age for the appropriate sex. Performer considers the normal ranges for the appearance of the developmental events, and considers whether the patient shows a high or low placement in the normal range within listed limits of two standard errors in either direction.
g. Performer may further refine the estimate by translating the patient's chronological age into height age when there is some discrepancy between the two (since bone age correlates better with height than chronological age).
h. Performer may check to be sure that known variations in carpal sequences have been considered; may check to be sure that the population on which the age-related radiographs have been standardized is contemporary and a proper comparison base for the patient.

4. If serial radiographs are available for the patient (taken at various ages) performer assesses the interval changes in the patient's series:

a. If performer did not evaluate serial films at the time they were made, performer evaluates each as in step 3.
b. Performer arranges serial films in chronological sequence on view boxes. Performer notes from the series when the maturity indicators for the ossification center appear and compares with normal age-at-appearance ranges listed in the appropriate atlas reference.
c. Performer assesses the number of bone age months gained between prior studies. Compares with chronological time elapsed.
d. Performer assesses the patient's rate of maturation as compared with the standard ranges.
e. Performer assesses the current bone age and the patient's rate of maturation noting the possible errors of judgment described above.

5. If radiographs associated with the "counting centers" technique have been produced (such as for an infant) performer counts the number of selected ossification centers shown in the infant skeleton and compares with a stan-

TASK DESCRIPTION SHEET (continued)

Task Code No. 449

This is page 3 of 3 for this task.

List Elements Fully

dard chart showing the total number of selected ossification centers at various ages (in months). Performer assesses the relative normality of the patient's bone age on the basis of this comparison, taking into account the ranges involved and the sex differences.

6. If the performer is to evaluate several radiographs based on a bone age sampling method (where the hand and wrist radiographs are supplemented by other selected centers according to relevant age-at-appearance ranges), performer proceeds to assess the bone age for each center and/or assesses the rate of maturation for serial studies as described above. Performer then comes to an overall assessment derived from the combined evaluations.

7. Performer personally prepares and/or dictates a report by indicating what was done, conclusions reached, and recommendations for further studies if appropriate. May consult with another radiologist:

   a. Performer indicates own name, the patient's name, sex, chronological age, and, if utilized, height age.
   b. Performer indicates what ossification center(s) were studied, whether this is an initial study or part of a series, and what ages of patient are already covered by series.
   c. Performer indicates the reference source used for the comparison standard and the conclusions arrived at. Performer may make comments on the specific maturity indicators which are retarded or early in appearance in patient. Reports any discrepancies in maturation such as carpals and long bone maturity.
   d. Performer indicates the normal ranges within which the assessment has been made.

List Elements Fully

   e. If an assessment of abnormality has been made, performer may consult standard tables listing abnormalities of skeletal maturation by the condition presented, and may report on what conditions might be suspected for the given bone age abnormality and patient's age. Performer may refer to the patient's disease history for possible explanations of deviant maturation rates.
   f. Performer may suggest additional studies to clarify an ambiguous condition. May consult a tabulation listing the major ossification centers which display active maturation by age-of-appearance and suggest additional studies appropriate to the patient's age. Performer may recommend follow-up examinations and series needed for more definitive evaluation based on age-of-appearance tables for ossification centers.

8. Performer may decide that the radiographic materials are unusual or of special interest and warrant inclusion in museum library or use in instruction. If so, performer marks jackets appropriately.

9. Performer places the radiographic materials, requisition sheet, and report or tape of dictation in proper jacket and places to be picked up for typing.

10. If appropriate or requested, performer may call and discuss results with referring physician.

TASK DESCRIPTION SHEET

Task Code No. 450

This is page 1 of 2 for this task.

1. What is the output of this task? (Be sure this is broad enough to be repeatable.)

Plain radiographs assessed for adequacy of demonstration of intestinal obstruction or foreign body; decision made on ordering and/or technique, views for contrast studies, on having removal of foreign body from upper esophagus done under fluoroscopy, on prior sedation; referring physician informed; record entered, requisition forms filled out as appropriate and placed for scheduling.

2. What is used in performing this task? (Note if only certain items must be used. If there is choice, include everything or the kinds of things chosen among.)

X-ray requisition form, patient's chart; processed radiographs of patient's gastrointestinal tract; view boxes; pen; telephone; requisition forms

3. Is there a recipient, respondent or co-worker involved in the task? Yes...(X) No...( )

4. If "Yes" to q. 3: Name the kind of recipient, respondent or co-worker involved, with descriptions to indicate the relevant condition; include the kind with whom the performer is not allowed to deal if relevant to knowledge requirements or legal restrictions.

Radiologic technologist; referring MD; radiologist; clerical staff

5. Name the task so that the answers to questions 1-4 are reflected. Underline essential words.

Evaluating plain films of pediatric gastrointestinal tract to localize obstructions and/or foreign bodies by reading and interpreting radiographs; deciding whether to order additional views, contrast studies; deciding whether to have foreign object(s) removed from upper esophagus under fluoroscopy; notifying referring MD of findings; recommending technique for contrast studies; ordering procedures as decided; recording medical impressions; arranging for scheduling.

List Elements Fully

Performer receives the plain radiographic films ordered for a neonate with suspected obstruction of the gastrointestinal tract and/or for a pediatric patient with a foreign body in the gastrointestinal tract as soon as they are processed.

1. Performer reads the patient's requisition form and relevant information to become familiar with the case.

   a. Notes age and sex of patient.
   b. Notes surrounding circumstances and suspected location of the obstruction and/or foreign body, and suspected nature of foreign body or obstruction.
   c. For neonate, performer may note relevant medical information on delivery and mother's condition.

2. Performer looks at radiograph(s) on view boxes:

   a. Determines whether the radiographs are technically adequate to demonstrate the area and condition under study and provide sufficient information to make possible a competent medical interpretation.
   b. May order a repeat or additional views at once. Indicates to technologist what is required and has these processed immediately, and views.

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6. Check here if this is a master sheet..(x)

TASK DESCRIPTION SHEET (continued)

Task Code No. 450

This is page 2 of 2 for this task.

List Elements Fully

3. Performer notes particularly the amount and distribution of gas in the intestinal tract:
   a. With neonate, relates this to the age of the infant in terms of normal expectations for distribution of gas in the tract.
   b. Notes indications of accumulation of gas and fluid as shown by distension of the intestinal tract (suggesting possible proximity to the site of obstruction or foreign body). With incomplete obstruction makes comparison of gas distribution on either side of distension.
   c. With foreign body evaluation performer attempts to locate object(s) by viewing the entire digestive tract. Looks for signs of exact location, nature of the object, the number, and the presence or absence of complications.

4. Performer may decide that the distribution of air does not adequately localize the site of the obstruction or foreign object(s). If so, performer may decide to order a contrast study of the appropriate portion of the gastrointestinal tract. May discuss with referring physician.
   a. Performer may decide that it is necessary to order the injection of air by tube to further demonstrate the point of obstruction.
   b. Performer may decide to order a positive contrast study. Chooses the type of contrast medium.
   c. Chooses the views required based on the level of the obstruction and the suspected nature of the obstruction.
   d. For foreign body localization performer may decide to order follow-up films to trace the advancement of the object(s) and demonstrate any complications.

List Elements Fully

5. Performer may decide that a foreign body is in the upper esophagus and can be removed under fluoroscopic control. If so, orders sedation for patient and has materials prepared for removal of the object. Performer may ask opinion of another radiologist; may discuss with referring physician.

6. If further radiography is to be ordered:
   a. Performer considers the urgency of the need and, if appropriate, expedites scheduling personally by discussing with appropriate staff. Arranges to obtain consent for procedure immediately from authorized adult.
   b. Performer writes orders, recommendations on technique, decisions on medication, and orders for patient's preparation on patient's chart explicitly so that appropriate personnel can prepare patient or be scheduled for work.
   c. Performer gives requisition and orders to appropriate staff person for scheduling if required. Signs requisition sheet if appropriate.

7. If performer decides that the nature and location of an obstruction or foreign object(s) has been adequately demonstrated, performer informs radiologic technologist that radiography is completed; calls the referring physician at once. Discusses immediate remedial steps such as surgery.

8. Performer may decide to dictate report at once, or records preliminary findings, care recommended, and/or additional radiography ordered on patient's chart and decides to prepare report at a later time.

TASK DESCRIPTION SHEET

Task Code No. 451

This is page 1 of 4 for this task.

1. **What is the output of this task?** (Be sure this is broad enough to be repeatable.)

Decision made whether to proceed to remove object; catheter size chosen; catheter inserted beyond object in esophagus under fluoroscopic control; balloon of catheter inflated; object removed by pulling back on catheter, or procedure terminated; condition discussed with MD; alternative procedures decided on; medical impressions, orders, delayed films, follow up care recorded.

2. **What is used in performing this task?** (Note if only certain items must be used. If there is choice, include everything or the kinds of things chosen among.)

Patient's requisition form, chart, radiographs; drape sheet; sterile towel; lamp; sterile gown, mask, gloves; sterile syringes; Foley catheter; contrast medium; clamp; emergency cart; fluoroscope with TV monitor, spot film attachment; protective lead garments; shielding; immobilization devices; pen; phone; tilt table

3. Is there a recipient, respondent or co-worker involved in the task? Yes...(X) No...( )

4. **If "Yes" to q. 3:** Name the kind of recipient, respondent or co-worker involved, with descriptions to indicate the relevant condition; include the kind with whom the performer is not allowed to deal if relevant to knowledge requirements or legal restrictions.

Pediatric pt. with foreign object in esophagus; accompanying adult; referring MD; radiologist; radiologic technologist; nurse; anesthesiologist

5. **Name the task** so that the answers to questions 1-4 are reflected. Underline essential words.

Removing foreign object from pediatric upper esophagus under fluoroscopic control by reviewing clinical history and prior radiographs, deciding whether to go ahead; inserting Foley catheter into esophagus through nose under fluoroscopic control; inflating balloon with contrast medium; removing object by pulling back on catheter or deciding to terminate; providing emergency care; discussing with referring MD; ordering delayed films or alternative procedure; recording medical impressions and orders.

List Elements Fully

Performer receives the x-ray requisition forms and radiographs for a pediatric patient scheduled to have a foreign body removed from the upper esophagus as a result of:

a. Request from co-worker.
b. Having decided to proceed with removal.

1. If not already done, performer reads the patient's requisition form and relevant medical information, including patient's age, sex, size, the nature and location(s) of the foreign object(s), and any possible complications.
   a. Performer studies on view boxes the plain films or contrast studies (radiographs) of patient which have been used to localize the foreign object. Notes location of objects and indications of related pathological conditions. Notes length of time object has been present.
   b. Performer notes whether patient has had a sedative ordered and administered. If not, may arrange to have this done.
   c. Performer checks to see that an authorized adult has signed a consent for the removal procedure. If not done, informs appropriate co-worker and arranges to have obtained if possible.

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6. Check here if this is a master sheet..(x)

TASK DESCRIPTION SHEET (continued)

Task Code No. 451

This is page 2 of 4 for this task.

List Elements Fully

List Elements Fully

2. Performer joins patient and any accompanying adult in examination room.
   a. If a relative of the patient is present, performer greets the individual as well as patient and explains what will occur. Performer may instruct and rehearse a child in what will occur to reassure and gain cooperation.
   b. Performer makes sure that any individuals who may be holding the patient (and anyone remaining in examination room) are properly shielded with protective lead garments.
   c. Performer may examine patient. May collect additional relevant medical history.

3. Performer considers whether there are contraindications to going ahead with the procedure based on the clinical information and the information on the radiographs.
   a. If the decision is not to proceed, may record reasons and any recommendations on patient's chart. If appropriate, discusses with referring physician. May help arrange for surgical removal procedures.
   b. If the decision is to proceed, performer makes final decisions on the materials to use, such as size of Foley catheter. Selects and orders appropriate contrast medium.
   c. Performer informs appropriate coworkers of decisions and has patient, materials, and equipment prepared. Has technical factors set for fluoroscopy. If anesthesia is to be administered,consults with anesthesiologist on timing of procedure.

4. When informed that patient and equipment are ready, performer checks whether patient has been properly immobilized, shielded, and positioned; may decide to immobilize personally. Reassures patient. If appropriate, checks with anesthesiologist.
   a. Performer checks that all materials needed are present, that correct drugs and sizes of items are present. Checks that emergency cart is present. Has any needed changes or adjustments made.
   b. Performer dons lead apron and sterile gown, gloves, and mask, when appropriate.
   c. Performer has cassette inserted in spot film attachment. Chooses full, half or quarter format and sets as appropriate. (If roll film attachment, checks that attachment is loaded with film or has this done.)

5. Performer prepares patient to have a Foley catheter inserted into upper esophagus using sterile technique and fluoroscopic control (or has this done by appropriate staff specialist).
   a. Explains what will occur. Encourages patient to relax and breathe regularly. Adjusts light.
   b. Performer checks catheter for defects(or has this done)by injecting sterile water into the balloon lumen in appropriate amount. Deflates balloon and empties water into basin, maintaining sterility of the catheter. Replaces on tray. Prepares a sterile syringe with appropriate amount of contrast medium or has this done.
   c. Performer positions the fluoroscope unit over the patient so as to best observe the location of the catheter as it is inserted,on the TV monitor. Activates to check placement and technical factors. Shuts when satisfied with adjustment.

TASK DESCRIPTION SHEET (continued)

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This is page 3 of 4 for this task.

List Elements Fully

6. Performer handles catheter with sterile gloves. Unless already done by staff specialist, inserts as follows:

   a. Performer chooses the more patent nostril for insertion of the catheter.

   b. Performer lubricates catheter tip with jellied sterile anesthetic. Inserts into nostril until end of catheter is visible through the patient's open mouth. Performer then advances the catheter into the pharynx. May refer to premarked point on catheter to determine how far to insert. Repositions at once if patient coughs or shows any respiratory distress.

   c. Once the catheter has entered the pharynx, performer activates fluoroscope and locates the catheter tip and the object to be removed on the TV monitor. Performer gently advances the catheter into the esophagus, beyond the foreign body, while viewing on monitor.

   d. When the catheter is in position, performer shuts fluoroscope and places patient in a right posterior oblique, slight Trendelenburg position.

   e. Performer attaches syringe with contrast medium to balloon lumen and slowly inflates the catheter baloon (which inflates behind foreign object). Activates fluoroscope and views on monitor. Performer clamps off the lumen and disconnects the syringe when the balloon is adequately inflated. Inserts a self-sealing device in balloon lumen if available or uses clamp.

7. Performer pulls back gently on the catheter in order to dislodge the foreign object and bring it up into the pharynx. Checks progress on TV monitor. Performer avoids use of force in pulling catheter.

List Elements Fully

   a. If the foreign body reaches the hypopharynx, performer encourages patient to cough up the object.

   b. If the object cannot be dislodged, performer avoids causing further complications. Removes catheter as described below, and decides to recommend esophagoscopy or surgical removal.

   c. If the performer observes that the foreign body has been advanced distally into the stomach during the procedure, performer removes the catheter as described below; may arrange to order series of plain films of abdomen.

   d. Performer may decide to take spot films at any time during the procedure, especially if performer notes signs of pathology. Activates spot film attachment and x-ray foot pedal as appropriate. If cassette attachment, may have technologist remove cassette as spots are snapped and insert additional cassettes, or does so personally.

8. Throughout procedure performer checks on the patient's condition. Is alert for possible severe reactions such as respiratory or cardiac distress or other adverse reaction.

   a. Performer determines the nature and severity of the condition. Removes all instruments from patient.

   b. Depending on the symptoms, performer may carry out any or all of the following emergency procedures using equipment on emergency cart:

      i) May administer oxygen or air using oxygen tank and mask or ambu bag.

      ii) May clear airway. May establish an airway.

TASK DESCRIPTION SHEET (continued)

Task Code No. 451

This is page 4 of 4 for this task.

List Elements Fully	List Elements Fully

iii) May decide on and administer IV infusion (such as barbiturates).

iv) Performer may suggest and administer adrenaline, a vasopressor in solution or other appropriate drugs.

c. Performer decides whether the reaction is sufficiently controlled to proceed with the procedure. Indicates decision to appropriate staff.

d. When patient has been revived, performer may record reaction and what was done on patient's chart.

9. When performer has removed the foreign object or decided to terminate, returns to patient and reassures. Opens lumen of balloon and allows contrast material to drain out. Then gently removes the catheter. Orders appropriate sanitary clean up procedures.

10. Performer may notify and confer with referring physician about an emergency condition or recovery procedures and other aspects of the case. May decide to order delayed films (especially if object was not removed).

11. Performer may record impressions of procedure on patient's chart:

   a. Results of procedure and recommendations.
   b. How patient tolerated the procedure.
   c. Any delayed films and follow-up care ordered.
   d. May sign chart or requisition sheet.

TASK DESCRIPTION SHEET

Task Code No. 452

This is page 1 of 5 for this task.

1. What is the output of this task? (Be sure this is broad enough to be repeatable.)

Decision made on whether to go ahead with radiography of esophagus;decisions made on technique, contrast solution and route of entry;catheter inserted; contrast material injected or feeding supervised;condition observed on TV monitor;spot and/or cine filming done;overhead radiographs ordered;complete set of radiographs approved;contrast material and catheter removed;orders given on delayed films,follow-up care; medical impressions recorded; MD notified of emergency signs.

2. What is used in performing this task? (Note if only certain items must be used. If there is choice, include everything or the kinds of things chosen among.)

X-ray requisition form,pt.'s chart,radiographs;view boxes;emergency cart;sterile tray with sterile catheters,syringes,jelly lubricant-anesthetic,forceps, sterile feeding bottle,cup,or spoon (or feeding tube),barium suspension or other contrast material; fluoroscope,TV monitor;spot film device;cineradiography camera and film; pen; telephone; protective lead garments; shielding; immobilization devices

3. Is there a recipient, respondent or co-worker involved in the task? Yes...(X) No...( )

4. If "Yes" to q. 3: Name the kind of recipient, respondent or co-worker involved, with descriptions to indicate the relevant condition; include the kind with whom the performer is not allowed to deal if relevant to knowledge requirements or legal restrictions.

Pediatric pt. to undergo radiography of esophagus; accompanying adult; referring clinician; pediatrician; radiologist; radiologic technologist; nurse

5. Name the task so that the answers to questions 1-4 are reflected. Underline essential words.

Conducting esophageal radiography of pediatric pt. by reassuring pt.;deciding on whether to go ahead;deciding on technique,contrast medium,amount,and route of introduction of contrast medium;inserting nasogastric catheter under fluoroscopic control;injecting or supervising feeding of contrast medium;taking spot films and/or cine film as decided;ordering overhead films; deciding when examination is complete by reviewing radiographs;removing contrast material and catheter; recording medical impressions,orders for follow-up care, delayed films; notifying MD of emergency signs.

List Elements Fully

Performer receives the x-ray requisition form and medical information for a pediatric patient scheduled for a radiographic contrast study of the esophagus. (Patients over four years have adult procedures.)

1. Performer reads the patient's requisition form and relevant medical information, including patient's age, sex, and any diagnostic information already collected, to become familiar with the case or to review material seen earlier.

   a. Performer notes nature of the suspected condition such as esophageal varices (enlarged vessels), atresia or stenosis (closure or stricture), fistula, hernia, chalasia (relaxation of opening), foreign body, sucking difficulties, pharyngeal incoordination, nasal regurgitation. Examines prior plain radiographs on view boxes to note the extent to which the condition has been demonstrated. Considers the appropriate contrast medium and technique in relation to suspected conditions, as well as route of administration (orally or by tube). Notes any recommendations on technique and/or contrast medium.

   b. Performer notes any other relevant medical information, such as whether patient is premature infant,

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6. Check here if this is a master sheet..(X)

TASK DESCRIPTION SHEET (continued)

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has a sensitivity to contrast media, and/or has conditions which might be contraindications to the procedure. Checks whether patient may have an infectious or communicable condition.

c. May call referring physician to discuss case or to obtain additional information.

d. Performer notes whether patient has an intravenous infusion in place to prevent dehydration. May ask for or check electrolyte level.

e. Performer checks to see that an authorized adult has signed a consent for the procedure. If not, arranges to have this done at once if emergency; may have examination delayed until consent is obtained or decides to obtain personally.

f. Performer notes whether orders on prior preparation of patient have been carried out (such as four hour prior abstinance from food and drink, administration of sedation or other medication). If not, has this done and/or has patient rescheduled as appropriate.

2. Performer greets any non-infant patient and any adult accompanying the patient in the examination room. Attempts to reassure. Explains what will be involved in the procedure. Answers questions. Performer questions accompanying adult about patient's current symptoms in relation to the condition being studied. May examine patient. May collect additional relevant medical history.

   a. Performer makes sure that all individuals to be in contact with a neonate patient are following proper sanitary procedures.

   b. If anyone is to remain in examination room, performer makes sure that he or she is properly shielded.

   c. If appropriate, performer explains procedure and obtains authorized adult's written consent. Does not

List Elements Fully

proceed unless there is a signed consent.)

3. Performer considers whether there are contraindications to going ahead with the procedure based on clinical information. May have clinician called and discusses patient's current condition and steps to be taken.

4. If performer decides not to proceed, records reasons and any recommendations on patient's chart. Informs appropriate co-worker. If appropriate, orders rescheduling of patient or scheduling for alternative procedure.

5. If performer decides to proceed, performer makes final decisions on technique, on type of contrast material and amount, on route of delivery, and whether to take spot films and/or employ cineradiography.

   a. Performer chooses barium suspension, barium sulfate cream or paste, or iodized oil, based on the nature of the suspected pathology, contraindications to various media, the suspected location of the pathology, and the patient's age.

   b. Performer chooses whether to administer by mouth (through cup or nursing bottle) or by catheter, based on the nature of the pathology suspected, the patient's ability to swallow or suck, and age. If a catheter is to be used, performer specifies size; may specify that catheter have end hole rather than side hole.

   c. Performer specifies amount of contrast to be prepared in cup, nursing bottle or syringe.

   d. Performer has cassette inserted for spot films. Chooses full, half or quarter format and sets as appropriate. (If roll film attachment, checks that attachment is loaded

TASK DESCRIPTION SHEET (continued)

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This is page 3 of 5 for this task.

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with film or has this done.) Has technical factors set for fluoroscopy.

e. Performer chooses whether or not to order that cine equipment be prepared based on need to demonstrate dynamic functioning. Indicates rate and frame settings for cine and has equipment checked.

f. Performer informs appropriate co-workers of decisions and has patient, materials and equipment prepared.

6. When informed that patient and equipment are ready, performer checks whether patient has been properly prepared.

   a. Dons protective lead garments and sterile gown, mask and gloves when appropriate. Checks staff shielding.

   b. Checks that all materials needed are present, that emergency cart is present.

   c. Checks that patient has been properly shielded, immobilized, and positioned on x-ray table. May decide to immobilize personally. Makes sure that a premature infant is kept adequately warm.

   d. If patient has an IV drip in place, makes sure that this has not been disturbed and that patient is not in distress. Performer remains alert to patient's condition throughout the procedure.

   e. Has any needed changes or adjustments made.

7. If patient is to have contrast administered through a catheter or feeding tube,performer proceeds as follows:

   a. Performer chooses the more patent nostril through which to insert a nasogastric tube.

   b. Performer lubricates catheter; may use jellied anesthetic. Performer inserts into patent nostril until end of catheter is visible through the patient's open mouth.

   c. Performer then advances the catheter into the esophagus and then into the stomach. Repositions at once if patient coughs or shows any respiratory distress. May advance tube to premarked point on catheter.

   d. Performer checks catheter position by activating fluoroscope and viewing TV monitor.

   e. Once performer has determined that the catheter has entered the stomach, performer pulls the catheter back into the esophagus to an appropriate level determined by the suspected location of the blockage or pathology (upper, middle or lower esophagus). Rechecks on TV monitor.

   f. When the catheter has been properly positioned, performer attaches syringe with positive contrast material to the catheter. Positions patient for injection of contrast as appropriate for the type of pathology suspected and location.

   g. Performer injects the medium in the appropriate amount required and observes the filling and distension on the TV monitor.

8. If the patient is to have contrast administered orally, performer proceeds as follows:

   a. Places fluoroscope unit in front of patient and positions patient appropriately.

   b. Performer has nurse or technologist hold spoon, cup, or feeding bottle containing the contrast material and await orders from performer.

   c. When ready for fluoroscopy, performer may have lights in room dimmed; turns on fluoroscope or has this done. Adjusts unit for viewing on TV monitor.

. TASK DESCRIPTION SHEET (continued)

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d. Performer indicates to the technologist or nurse when the patient is to sip mixture, hold in mouth, when to swallow, what positions to assume or place the patient in, and when to hold the patient steady. Performer may position patient on table personally.

e. Performer has the patient sip, drink, be fed, or suck the contrast material as needed while observing the filling and distension of the area of interest on the TV monitor.

f. Performer notes the ease or difficulty with which the patient swallows. Performer may instruct the patient in the frequency and size of swallows. Performer observes the structures and their movement until the performer has sufficient information on the condition being studied.

9. Performer observes the flow of the contrast and looks for signs of the suspected pathological structures and condition:

a. Performer moves the unit, table, and/or the patient into positions appropriate for the conditions being studied.

b. While observing on TV monitor the performer decides what to record as spot films or on cine film. As decided, performer activates the cine camera and/or spot film attachment and x-ray button. If cassette attachment is being used, may have technologist remove cassette as spots are snapped and insert additional cassettes, or performer does so personally.

List Elements Fully

10. Throughout procedure performer checks on the patient's condition. Is alert for possible severe reactions such as respiratory or cardiac distress or adverse reaction to contrast medium:

a. Performer may remove catheter from patient. Determines the nature and severity of the condition.

b. Depending on the symptoms, performer may carry out any or all of the following emergency procedures using equipment on emergency cart:

   i) May apply mouth-to-mouth resuscitation; may administer oxygen or air using oxygen tank and mask or ambu bag; may clear airway or establish an airway.

   ii) May order suction machine, insert tube, and supervise or personally apply suction to clear out occluded passages.

   iii) May decide on and administer an IV infusion (such as barbiturates). May administer adrenalin, parenteral hydrocortisone, antihistamine, a vasopressor in solution, or other appropriate drugs.

c. Performer decides whether the reaction is sufficiently controlled to proceed with the procedure.

d. When patient has been revived, performer may record reaction and what was done on patient's chart.

e. If the decision is to terminate, indicates this to appropriate staff.

11. Performer determines when the fluoroscopic portion of the examination is over and turns off the fluoroscope and/or cine camera. Has spot and cine films processed at once.

Performer decides, based on observations during fluoroscopy, whether to

TASK DESCRIPTION SHEET (continued)

Task Code No. 452

This is page 5 of 5 for this task.

List Elements Fully

have radiologic technologist take overhead radiographs. Explains what is needed to technologist and/or enters on requisition sheet.

Performer may record preliminary medical impressions at once on requisition sheet or delay until the radiographs are processed.

12. Performer looks at the processed spot films and radiographs on view boxes as soon as they are ready:

    a. Determines whether the radiographs are technically adequate to demonstrate the area and condition under study and provide sufficient information to make possible a competent medical interpretation. Performer may ask opinion of another radiologist.
    b. Performer decides to administer additional contrast, take additional views, or repeat portions of the radiographic examination only in extreme circumstances. Considers the information already available on the radiographs, the way in which the patient responded to the procedure, the patient's condition, and his or her cumulative exposure.
    c. Performer may decide to cause a backward flow of the contrast medium for study of some conditions. If so, presses on infant's abdomen to cause the reflux and repeats appropriate steps.
    d. Performer examines any additional radiographs as described above.
    e. Performer may have an infant fed at any time that this will not interfere with the remainder of the study. Orders appropriate food and/or drink.
    f. Performer may decide to order delayed film(s) to be taken after a proper elapse of time. If so, may fill out appropriate requisition and/or have this done.

List Elements Fully

13. Performer determines when the examination is completed. If appropriate, performer returns to the patient to remove the medium instilled (a catheter will have been used for instillation of such a medium). Uses aspiration:

    a. Performer attaches empty syringe to injection catheter.
    b. Performer adjusts the inclination of the table and pulls back on the syringe plunger so that the contrast medium drains out by aspiration. Performer may note progress by looking at the image of the medium on the TV monitor. Performer determines when the medium has been appropriately removed.
    c. Performer reassures patient. Removes the catheter gently. Has subordinates terminate the procedure. Has appropriate sanitary clean up procedures carried out.

14. Performer may notify and confer with referring physician at once about any emergency condition, orders for recovery procedures, and/or other aspects of the case.

15. Performer may record impressions of procedure on patient's chart:

    a. Results of procedure and recommendations, including orders for delayed films.
    b. How patient tolerated the procedure.
    c. Any follow up care ordered.
    d. May sign chart or requisition sheet.

TASK DESCRIPTION SHEET

Task Code No. 453

This is page 1 of 7 for this task.

1. What is the output of this task? (Be sure this is broad enough to be repeatable.)

Decisions made on going ahead,technique,use of nasogastric tube;catheter inserted;gastric contents sampled;barium instilled or given orally under fluoroscopic control;esophagus,stomach,duodenum observed; spot films,cine and/or videotape records made;pressure spots of stomach taken;overhead films ordered, reviewed,approved;decisions made on air contrast of stomach,delayed small bowel films;air contrast instilled,stomach viewed;medical impressions,orders for follow-up care recorded;MD notified of emergency,

2. What is used in performing this task? (Note if only certain items must be used. If there is choice, include everything or the kinds of things chosen among.)

X-ray requisition form,pt.'s chart,prior radiographs; view boxes;emergency cart;sterile tray with prepared barium suspension,sterile feeding bottle,nipple,or cup,straw,spoon,or nasogastric tube;carbonated beverage;syringes,test tubes,jelly lubricant-anesthetic; fluoroscope,table,TV monitor,spot film,cine and/or videotape attachments;protective lead shielding;gown, gloves,mask;immobilization devices;pressure cone or paddle;pen;telephone

3. Is there a recipient, respondent or co-worker involved in the task? Yes...(X) No...( )

4. If "Yes" to q. 3: Name the kind of recipient, respondent or co-worker involved, with descriptions to indicate the relevant condition; include the kind with whom the performer is not allowed to deal if relevant to knowledge requirements or legal restrictions.

Pediatric patient to undergo study of upper GI; accompanying adult; referring MD; pediatrician; radiologist; radiologic technologist; nurse

5. Name the task so that the answers to questions 1-4 are reflected. Underline essential words.

Conducting radiographic barium study of upper gastrointestinal tract of pediatric pt. by reassuring;deciding whether to go ahead,technique;inserting nasogastric tube;sampling gastric contents;instilling barium or having barium given orally,under fluoroscopic control;observing organs;spot filming,taking cine or videotape films;taking pressure spot films of stomach;ordering overhead radiographs;deciding on air contrast of stomach,delayed small bowel films; carrying out air contrast instillation and filming; viewing radiographs,approving complete set;recording medical impressions,orders for care;notifying MD of emergency signs.

List Elements Fully

Performer receives the x-ray requisition form and medical information for a pediatric patient scheduled for a study of the upper gastrointestinal tract (esophagus, stomach, and duodenum) using a barium sulfate colloidal suspension as the contrast medium. Study may include the small bowel as well. (Patients over four years have adult procedures.)

1. Performer reads the patient's requisition form and relevant information to become familiar with the case (if study was routinely ordered) or to review materials seen earlier. Notes patient's age, sex, and any diagnostic information already collected.
    a. Performer notes the nature of the suspected condition and suspected location. Studies prior plain films on view boxes to be sure that pathology of the lungs, pleural cavity and diaphragm can be ruled out. Notes the extent to which gas is demonstrated in the gastrointestinal system, especially if patient is a neonate.
    b. Notes whether any conditions exist which would require introduction of the contrast through a nasogastric tube or use of a contrast medium other than barium (in liquid or cream form). Notes any recommendations on technique.

OK-RP;RR;RR

6. Check here if this is a master sheet..(X)

TASK DESCRIPTION SHEET (continued)

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List Elements Fully

List Elements Fully

c. Performer notes any other relevant medical information such as whether patient is a premature infant, has an infectious or communicable condition, or has any related conditions which might be contraindications to the procedure.

d. Performer notes whether patient has an intravenous infusion in place to prevent dehydration. May ask for or check electrolyte level.

e. Performer checks to see that an authorized adult has signed a consent for the procedure. If not, arranges to have this done at once if emergency; may have examination delayed until consent is obtained or decides to obtain personally.

f. Performer notes whether orders on prior preparation of patient have been carried out (such as four-hour prior abstinance from food and drink, administration of sedation or other medication). If not, has this done and/or has patient rescheduled as appropriate.

g. Performer may call referring pediatrician to discuss case or to obtain additional information. Notes whether physician will be in attendance during procedure (in case of serious illness).

2. Performer greets any non-infant patient, accompanying adult and pediatrician (if present) in examination room.

   a. Performer reassures patient and adult with patient. Explains what will be done. Answers questions. With child, may instruct and rehearse patient in the procedures to follow so as to obtain patient's cooperation.

   b. Performer questions accompanying adult,and/or patient about patient's current symptoms in relation to the condition being studied. May examine patient. May collect additional relevant medical history. May discuss with referring physician. Notes whether patient is able to suck, sip, or swallow.

   c. Performer makes sure that all individuals to be in contact with a neonate patient are following proper sanitary procedures.

   d. If anyone is to remain in examination room, performer makes sure that he or she is properly shielded.

   e. If appropriate, performer obtains written consent for procedure from authorized adult. Explains the procedure and the risks involved. (does not proceed unless there is a signed consent.)

3. Performer orders a scout film. Indicates to technologist when to take scout. May decide to have patient immobilized prior to filming.

   a. When the scout film is ready, performer evaluates on view box. Performer determines whether the technical quality of the radiograph adequately demonstrates the organs to be studied for purposes of interpretation; if not, performer indicates the needed technical adjustments or changes in position to technologist, or records on requisition form.

   b. Performer inspects scout film to see whether there is evidence of food and/or barium remaining from any earlier study, thus interfering with current examination.

4. Performer considers whether there are contraindications to going ahead with the procedure based on clinical information and scout film. May discuss patient's current condition and steps to be taken with referring physician.

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5. If performer decides not to proceed, records reasons and any recommendations on patient's chart. Informs appropriate co-worker. If appropriate, orders rescheduling of patient or scheduling for alternative procedure.

6. If performer decides to proceed:

   a. Performer decides on route of administration of contrast material (orally, by nursing bottle, spoon, straw, or cup, or via opaque nasogastric catheter), depending on whether patient is able to suck, sip, or swallow adequate amounts of the contrast medium.
   b. Performer decides on the type of barium mixture to have prepared, the amount, and whether to have it flavored (and with what), based on the organs to be studied and any suspected conditions, as well as patient's age and size.
   c. Performer orders appropriate materials, and catheter type and size as decided. Has sterile contrast material prepared as liquid or cream in appropriate sterile nursing bottle, cup, or syringe.
   d. Performer has technical factors set for fluoroscopy. Has cassette inserted for spot films. Chooses full, half or quarter format and sets as appropriate. (If roll film attachment, checks that attachment is loaded with film or has this done.)
   e. Performer has videotape and/or cineradiography camera and film prepared for use if dynamic functions are to be recorded. Indicates rate and frame settings for cine.
   f. Performer has patient prepared, immobilized, shielded, and positioned, or decides to immobilize and position personally. If appropriate, has compression device put in place on fluoroscope unit.

List Elements Fully

   g. Performer dons protective lead garments and sterile gown, mask, and gloves when appropriate.

7. When informed that patient and equipment are ready, performer checks whether patient has been properly prepared for insertion of catheter or to have contrast material administered orally.

   a. Checks whether patient has been properly positioned, shielded and immobilized. Indicates adjustments needed or decides to adjust personally.
   b. Makes sure that a neonate patient is being kept adequately warm.
   c. If patient has an IV drip in place, makes sure that this has not been disturbed and that patient is not in distress.
   d. Performer remains alert to patient's condition throughout the procedure.
   e. Checks that all materials needed are present, that emergency cart is present. Has any missing objects brought.

8. If the patient is to have the barium administered through a nasogastric tube, performer proceeds as follows:

   a. Prepares fluoroscope unit for monitoring by positioning unit so that the patient's stomach and the catheter will be visible. May check by activating fluoroscope, viewing, and readjusting patient or table.
   b. Performer chooses the more patent nostril for insertion of the catheter. Makes sure catheter is correct size.
   c. Performer lubricates catheter tip with jellied sterile anesthetic. Inserts into nostril until end of catheter is visible through the patient's open mouth. Performer then

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advances the catheter into the esophagus and then into the stomach. May refer to premarked point on catheter to determine how far to insert.

d. Performer may check catheter position by activating fluoroscope and viewing catheter position on TV monitor.

e. Performer may check that the catheter has entered the stomach by attaching a sterile syringe and attempting to aspirate gastric juice. If no juice is aspirated, performer advances catheter until some is obtained.

f. Performer may decide to aspirate a quantity of fluid and air to facilitate adequate coating of the distal stomach. May have sample placed in test tubes for laboratory analysis.

g. If the esophagus is to be studied, performer pulls the catheter back into the esophagus to the desired level.

h. If the performer encounters serious difficulty in advancing the catheter, performer checks problem by viewing on TV monitor. May decide to initiate instillation from point of blockage.

i. When the catheter has been properly positioned for the study of the esophagus (if included) performer checks syringe containing barium contrast material. Positions patient and/or x-ray table for instillation. Attaches syringe to the catheter and injects the medium in the amount appropriate for studying the esophagus. Activates fluoroscope and observes the filling on the TV monitor.

9. If the patient is to suck the barium through a feeding bottle, sip it through a straw, have it spoon fed, or drink it from a cup, performer has the patient positioned for this, lying on table, sitting on stool, or standing in front of table as appropriate.

a. Performer places the fluoroscopic unit in front of or over patient.

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b. Performer has nurse or technologist hold nursing bottle, cup and spoon, cup and straw, or cup near patient and await orders from performer.

c. When ready for fluoroscopy, performer may have lights in room dimmed; turns on fluoroscope or has this done. Adjusts unit for viewing on TV monitor.

d. Performer indicates to patient (if he or she can cooperate) or to technologist or nurse when to have patient sip mixture from spoon, straw or cup, or has infant given bottle to nurse. Indicates how much is to be taken; has a child follow directions on when to hold in mouth, when to swallow. Indicates what patient positions are required or positions infant personally. Indicates when infant or child is to hold still or be held still.

e. Performer activates videotape equipment to record swallowing movements and/or has cine equipment activated when appropriate.

f. Performer observes the swallowing and filling on the TV monitor. Repeats orders on frequency and size of swallows as appropriate. Notes the ease or difficulty with which the patient swallows.

g. If the patient is not able to take the barium in sufficient amount or is having great difficulty in swallowing, performer may decide to insert a nasogastric catheter. If so, proceeds as described above.

10. Performer places patient, table and unit into appropriate positions to study the esophagus or has patient or technologist assist.

a. Performer observes the flow of the contrast and looks for signs of constriction or other pathological

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structures. Performer continues until satisfied with information obtained.

b. While observing on TV monitor, performer decides what to record as spot films and/or on cine film. As decided, performer activates cine or videotape camera and/or spot film attachment and x-ray button. If cassette attachment, may have technologist remove cassette as spots are snapped and insert additional cassettes, or performer does so personally.

11. If appropriate, performer proceeds to study the patient's esophagogastric juncture, gastric mucosa, pyloric canal, duodenal cap, duodenal loop, and follows the barium column past the ligament of Treitz. Throughout procedure:

   a. Performer has the patient take or be placed in appropriate positions to observe the structures. May adjust table and/or fluoroscope unit.
   b. Performer observes the flow and progress of the contrast material through the organs of interest. Takes spot films, cine and/or videotape records as deemed appropriate.
   c. If using videotape, performer may, at any point in the process, interrupt the procedure, press the return tape and have the tape projected on screen. Examines replay for clarification of what was seen. Advances again and proceeds with procedure when appropriate.
   d. Has additional barium administered or instills personally as needed to maintain adequate visualization.
   e. Performer remains alert to the patient's condition and reaction to the procedure. Notes any signs of respiratory distress or adverse reaction. May decide to provide emergency care as required.

List Elements Fully

12. Performer may decide to prepare pressure spot films of the gastric mucosa and the duodenal bulb. If so:

   a. If the child is old enough and will cooperate, performer positions patient and has pressure cone attachment moved into place. Performer positions cone so that there is pressure exerted on the area of interest. For infants and children who have been immobilized on table, performer uses a pressure paddle, gently pressing the paddle on the desired area.
   b. Performer observes the area on the TV monitor. Observes the response to pressure and the pliability and rigidity of the area.
   c. Performer decides what to record as spot films, cine or videotape and activates appropriate attachment when decided, as described above.
   d. Performer repeats pressure procedure for other areas of the stomach and for duodenal cap (bulb) as required. May vary patient's position.
   e. When performer has taken all the pressure spot films needed, removes the pressure cone or paddle.

13. Once the performer decides that the fluoroscopic examination of the esophagus, stomach and duodenum is completed, performer turns off the fluoroscope.

   a. Orders overhead films. Specifies what is required or has standard films taken, based on observations.
   b. May have additional contrast material administered or injects personally, as described above.
   c. Has spot films, overhead films and cine films processed at once.

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14. Performer looks at the processed spot films and radiographs on view boxes as soon as they are ready:

    a. Performer determines whether the radiographs are technically adequate to demonstrate the area and condition under study and provide sufficient information to make possible a competent medical interpretation. May ask opinion of another radiologist. Orders a change and repeats filming only in extreme circumstances. Indicates needed adjustments to technologist.

    b. Performer notes whether the problem area could involve the top or the distal stomach (areas blocked from view by the rib cage). If so, performer may decide to order an air contrast study to distend the stomach:

        i) Decides whether to inject air through a nasogastric tube already in place, or, if patient has had barium administered orally, whether to insert nasogastric tube, or administer air by use of a straw, empty feeding bottle, carbonated beverage in feeding bottle or cup.
        ii) Indicates decisions to technologist and has materials prepared if not already done.

    c. Performer determines whether it is desirable to follow with a small bowel study. If so decided, performer decides whether to do a fluoroscopic study with spot filming or to proceed with delayed overhead films of the small bowel.

        i) May have additional barium administered or decides to inject personally, as required.

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        ii) For overheads, indicates the time elapses at which exposures should be taken. Indicates exposures and positions required.
        iii) May order that food and drink be provided after the barium has reached the mid-small bowel.

15. For air contrast study of the stomach has patient placed in appropriate position based on selected route for air contrast.

    a. If a nasogastric tube is to be used, performer inserts as described above and/or positions or repositions in stomach using fluoroscopic controls.

        i) Performer has empty sterile syringe prepared for injection of air through catheter.
        ii) Positions patient and/or tilt table for injection of air.
        iii) Attaches syringe to the catheter and injects air in the appropriate amount.
        iv) Activates fluoroscope and observes filling on the TV monitor.

    b. If patient is to have the air administered orally, performer has the patient positioned as appropriate, standing in front of table, seated, or immobilized on table, depending on the age and condition of patient.

        i) Repositions fluoroscope unit in front of or over patient.
        ii) Has nurse or technologist hold materials needed (such as empty feeding bottle or filled with carbonated beverage, straw

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with hole in its shaft, or carbonated beverage in cup) and await orders from performer.

iii) When ready, has nurse or technologist assist patient to suck on feeding bottle, place straw in patient's mouth with hole in shaft outside of mouth and encourage patient to suck in air, or has patient drink carbonated beverage in cup.

c. Performer observes stomach under fluoroscopic control as air is instilled, sucked in, or gas is released through beverage. Notes whether there is sufficient distension and has more air taken in or instills more if so decided.

  i) Performer observes the stomach structures and movement until the performer has sufficient information on any pathological condition.
  ii) While observing on TV monitor, performer may decide what to record as spot films. Does so as decided, as described.
  iii) Performer may decide to make pressure spot films. If so, proceeds as described earlier.
  iv) Performer may continue with observation with patient in appropriate positions as described earlier.

d. Performer may order overhead films. Reviews when processed as described earlier.

16. If a delayed small bowel study has been ordered with fluoroscopy, performer carries out observation of the small bowel as described, after the appropriate elapse of time.

List Elements Fully

a. Repeats spot filming if so decided. May order overheads.
b. Performer evaluates delayed spot films and/or overheads as described above. May decide on fluoroscopy after viewing overheads; repeats appropriate steps.

17. Performer determines when the radiographic examination is completed. Returns to patient:

a. If the nasogastric catheter is still in place, performer removes syringe and gently removes the catheter.
b. Informs technologist that he or she can terminate the procedure and have the patient sent home, back to room, or to next procedure.
c. If appropriate, orders decontamination and/or sanitary clean up procedures.

18. If performer judges that any emergency signs are in evidence, performer notifies patient's referring physician at once. May confer about recovery procedures and/or other aspects of the case.

19. Performer may record impressions of procedure on patient's chart:

a. Preliminary findings.
b. How patient tolerated procedure.
c. Any special nursing follow-up recommended, delayed films or laboratory tests ordered.
d. May sign chart, requisition sheet.

TASK DESCRIPTION SHEET

Task Code No. 454

This is page 1 of 6 for this task.

1. What is the output of this task? (Be sure this is broad enough to be repeatable.)

Decision made on going ahead, on contrast material; pt. reassured; enema tip inserted; enema flow directed under fluoroscopic control; spot films made; overhead radiographs ordered; post-evacuation films ordered; air contrast enema conducted if so decided; complete set of radiographs approved; delayed films and follow-up care ordered; medical impressions recorded; MD notified of emergency signs.

2. What is used in performing this task? (Note if only certain items must be used. If there is choice, include everything or the kinds of things chosen among.)

X-ray requisition form, patient's chart; prior films; view boxes; prepared barium or other contrast enema; fluoroscope, TV monitor, spot film device, table; gown, gloves; pen; telephone; protective lead garments; air insufflator, syringe, tube, clamp, tape; immobilization devices; shielding; barium paste; emergency cart

3. Is there a recipient, respondent or co-worker involved in the task? Yes...(x) No...( )

4. If "Yes" to q. 3: Name the kind of recipient, respondent or co-worker involved, with descriptions to indicate the relevant condition; include the kind with whom the performer is not allowed to deal if relevant to knowledge requirements or legal restrictions.

Pediatric patient to have lower GI radiography; accompanying adult; referring physician; pediatrician; radiologist; radiologic technologist; nurse

5. Name the task so that the answers to questions 1-4 are reflected. Underline essential words.

Conducting a radiographic barium enema study of lower gastrointestinal tract of pediatric patient by deciding whether to go ahead; reassuring pt.; deciding on contrast material; supervising or conducting administration of enema; viewing on fluoroscope monitor; taking spot films; ordering overhead radiographs; ordering post-evacuation films; supervising or conducting air contrast enema if so decided; deciding when examination is completed by viewing radiographs; ordering delayed films; recording medical impressions, orders for follow-up care; notifying MD of emergency signs.

List Elements Fully

Performer receives the x-ray requisition form and medical information for a pediatric patient scheduled for examination of the lower gastrointestinal tract (especially colon) with barium enema.

1. Performer reads the patient's requisition form and relevant information to become familiar with the case or to review materials seen earlier. Notes patient's age, sex, size, and any diagnostic information already collected.
   a. Performer notes the nature of the suspected condition and suspected location. Studies prior plain films or films of prior study on view boxes to note the extent to which the condition has been visualized. Notes the extent to which gas is demonstrated in the gastrointestinal system, especially if patient is a neonate.
   b. Notes whether the patient has an ileostomy or colostomy.
   c. Notes whether the patient's age, presenting condition, or the nature of the expected pathology requires or contraindicates a preparatory cleansing enema, prior abstinence from food and drink, and what was ordered.
   d. Performer notes whether the patient's condition requires a contrast medium

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6. Check here if this is a master sheet..(X)

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other than a barium sulphate mixture, with or without saline.

e. Performer notes any other relevant medical information, such as whether pediatric patient is a premature infant, has an infectious or communicable condition, or has any related conditions which might be contraindications to the procedure.

f. Performer notes whether patient has an intravenous infusion in place to prevent dehydration. May ask for or check electrolyte level.

g. Performer checks to see that an authorized adult has signed a consent for the procedure. If not, arranges to have this done at once if emergency; may have examination delayed until consent is obtained or decides to obtain personally.

h. Performer notes whether orders for prior preparation of patient have been carried out (such as prior abstinance from food and drink for a given period of time, prior administration of cleansing enema, sedation or other medication). If not, has this done and/or has patient rescheduled as appropriate.

i. Performer may call referring physician to discuss case or to obtain additional information. Notes whether pediatrician will be in attendance with patient during procedure (in case of serious illness).

2. Performer greets any non-infant patient, accompanying adult, and pediatrician (if present) in examination room.

   a. Performer reassures patient and/or adult with patient. Explains what will be done. Answers questions. With child, may instruct and rehearse patient in the procedures to be followed so as to obtain patient's cooperation.

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   b. Performer questions accompanying adult and/or patient about patient's current symptoms in relation to the condition being studied. May examine patient. May collect additional relevant medical history. May discuss with referring physician.

   c. Performer makes sure that all individuals to be in contact with a neonate patient are following proper sanitary procedures.

   d. Performer makes sure that anyone remaining in the room is properly shielded.

   e. If appropriate, performer obtains written consent for procedure from authorized adult. Explains the procedure and the risks involved. (Does not proceed unless there is a signed consent.)

3. Performer may order a scout film. Views when ready or views scout film already prepared by technologist.

   a. If the technical quality of the scout film is not acceptable, performer indicates the needed adjustments in position or technique to technologist.

   b. Performer notes relevant information for conducting procedure and extent to which gas and feces are present in colon.

4. Performer considers whether there are contraindications to going ahead with the procedure based on clinical information (and scout film if obtained). May discuss patient's current condition and steps to be taken with referring physician.

5. If performer decides not to proceed, records reasons and any recommendations on patient's chart. Informs appropriate co-worker. If appropri-

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iate, orders rescheduling of patient or scheduling for alternative procedure.

6. If performer decides to proceed:
    a. Performer decides on and orders the contrast material to be used, such as barium sulfate mixture or iodine based water soluble agent, or other liquid medium. Has enema and any other equipment needed prepared and checked.
    b. Performer has technical factors set for fluoroscopy. Has cassette inserted for spot films. Chooses full, half or quarter format and sets as appropriate. (If roll film attachment, checks that attachment is loaded with film or has this done.)
    c. Performer has patient prepared, immobilized, shielded, and positioned for enema. May decide to immobilize personally. Dons protective lead garments and gown and gloves.

7. Performer returns to patient in x-ray room when informed that patient and materials are ready.
    a. If patient is able to comprehend, performer talks about what is to be done and why. Attempts to alleviate patient's fears and develop confidence. Answers patient's questions. Makes sure patient understands that he or she is to retain enema until told to evacuate by performer.
    b. Checks whether patient has been properly positioned, shielded and immobilized. Indicates adjustments needed or decides to adjust personally.
    c. Makes sure that an infant patient is being kept adequately warm.
    d. If patient has an IV drip in place, makes sure that this has not been disturbed and that patient is not in distress.
    e. Performer remains alert to patient's condition throughout the procedure.
    f. Performer checks that all materials needed are present, that emergency cart is present. Has any missing objects brought.
    g. Checks that enema has been prepared and hung at proper height near patient. Has it checked by having some of the mixture run through tubing.
    h. Prepares fluoroscope unit for monitoring by positioning unit so that the patient's pelvic area will be visible. May check by activating, readjusting, and shutting fluoroscope.

8. If required for later interpretation, such as to study imperforate anus, performer orders or checks that patient has had body markings made with thick barium suspension (paste) in the middle of the natal cleft, perineum, and the anal dimple.

9. Performer directs insertion or inserts the enema tip as follows:
    a. Performer indicates to subordinate when to insert the enema tip into the patient's rectum and position patient in appropriate position for fluoroscopy.
    b. With patient suffering from obstruction in the aganglionic segment of bowel, has enema tip inserted only a short distance.
    c. Has technologist or nurse "sandwich" the buttocks together firmly with nonopaque adhesive tape to help retain the enema.
    d. If patient has colostomy or ileostomy, performer decides whether to opacify through the rectum or

TASK DESCRIPTION SHEET (continued)

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stoma. If the stoma, performer removes the dressing and drainage bag or has this done. Inserts enema tip through the stoma.

10. Performer may have lights in room dimmed; positions fluoroscope unit, adjusting position by viewing on TV monitor.

11. Performer indicates to technologist when to start the flow of the contrast solution by opening the enema clamp, or does personally. Indicates rate of flow depending on condition being studied. Performer indicates throughout procedure when to reclamp enema, when to let it flow, and when to reclamp. Has flow stopped when the barium column has reached the desired level.

    a. Performer watches the flow of the solution through the large intestines by activating the fluoroscope and watching on the TV monitor.
    b. Performer observes the flow of the barium solution through the rectum, sigmoid, descending, transverse and ascending colon, cecum and terminal ileum, concentrating on areas of suspected pathology. Performer observes structures and movement. May reassure patient and encourage to retain enema. May move fluoroscope unit or table to obtain other views. Watches to be sure that pressure of enema is not excessive. May make notes while observing.
    c. While observing, performer decides what to record by taking spot films. Instructs patient when to remain motionless for spot film exposures and when to resume normal breathing and relax. As decided, performer activates spot film attachment and foot pedal for radiography. If cassette attachment, may have technologist remove cassette as spots are taken and insert additional cassettes, or does so personally.
    d. Performer notes patient's reactions throughout procedure for signs of adverse reactions; may decide to provide emergency care. If the patient is unable to retain the enema, or is not tolerating the procedure, performer may decide to terminate. May record any relevant observations on appropriate form; notifies appropriate staff.

12. Performer decides when to stop administration of enema. If patient is able to comprehend, reminds patient to retain enema and asks patient how he or she is feeling.

13. Performer decides, based on observations during fluoroscopy, when to have radiologic technologist take standard series of overhead radiographs and whether to order additional exposures and/or positions, with enema retained. Indicates orders to technologist. May record.

    a. May lift infant and hold in inverted position for several minutes before filming if appropriate.
    b. Performer has spot films and radiographs processed at once and examines on view boxes. Judges whether the technical factors and positioning are adequate for satisfactory interpretation. Indicates needed adjustments.

14. Once pre-evacuation films are judged adequate, performer has patient allowed to evacuate and orders post-evacuation films to provide detailed information on the colonic mucosal pattern. Indicates views for overheads and has post-evacuation films processed at once.

TASK DESCRIPTION SHEET (continued)

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List Elements Fully	List Elements Fully
15. Performer reviews all the radiographs and spot films taken on view boxes: a. Performer determines whether the films are technically adequate to demonstrate the area and condition under study and provide sufficient information to make possible a competent medical interpretation. Performer may ask opinion of clinician or another radiologist. b. Decides whether it would be desirable to repeat any portion of the examination and/or desirable to do an air contrast study to provide more information. Considers the patient's condition and cumulative radiographic exposure and the desirability of additional information. c. If repeat filming is to be done, performer indicates what is needed and/or repeats appropriate steps; reviews radiographs as above. 16. If performer orders air contrast, performer supervises the introduction of the air medium into the large intestines using fluoroscopy. Reassures patient and explains what will happen. Carries out personally or supervises while nurse or technologist, prepares an air insufflator, attaches rectal tip and clamp, and inserts tip into patient's rectum. Has buttocks taped together as described above. a. Performer positions patient and overhead fluoroscope unit and observes on TV monitor while administering the air. Performer opens the clamp and adjusts the rate of flow of air to instill the proper amount of air needed without excessive pressure. Performer checks for appropriate distension. b. Performer turns patient from side to side or has this done during	filling to facilitate visualization. Views areas of interest on TV monitor, such as sigmoid colon, cecum, splenic flexure, and hepatic flexure. c. Performer views the suspicious areas noted during earlier fluoroscopy and on radiographs, as described above. Performer takes spot films as deemed appropriate, as described above. d. Performer decides when enough spot films with the air contrast medium have been taken and turns off the fluoroscope. e. Performer decides on the radiographs to order with air contrast medium retained. May record orders. Performer encourages the patient to retain the air. f. Performer reviews the processed air contrast films as described above, ordering any additional ones as needed. 17. When performer has determined that the examination has been completed, indicates this to appropriate staff. a. Opens clamp of air insufflator and allows air to escape. b. With infants, has enema bag lowered below patient's level and allows any remaining liquid enema drain out by gravity. c. If not already done, has tape and enema tube removed or does personally. d. Performer has patient cleansed; has room and equipment cleaned with antiseptic solution; has any other appropriate clean up procedures followed to avoid infection or contamination. e. If patient has a colostomy or ileostomy, has a fresh drainage bag and dressing applied or decides to do personally.

TASK DESCRIPTION SHEET (continued)

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List Elements Fully	List Elements Fully
f. May have an infant provided food and drink immediately. 18. If performer judges that any emergency signs are in evidence, performer notifies patient's physician. Notifies physician or surgeon of preliminary findings if so requested. 19. Performer may decide to order delayed films, such as several hours later (to reveal more distal penetration of colonic gas), or a day or more later. 20. Performer may record impressions of procedure on patient's chart: a. Preliminary findings. b. How patient tolerated procedure. c. Any special nursing follow-up recommended, delayed films ordered. d. May sign chart or requisition sheet.	

TASK DESCRIPTION SHEET

Task Code No. 455

This is page 1 of 5 for this task.

1. What is the output of this task? (Be sure this is broad enough to be repeatable.)

Decisions made on going ahead,on contrast material; pt.reassured;enema insertion supervised;enema flow directed under fluoroscopic control;spot films,cine and/or videotape record made;pre-evacuation radiographs ordered;evacuation spots,cine,overhead films made;post-evacuation films ordered;complete set of radiographs approved;medical impressions,orders for follow-up care recorded; MD notified of emergency sings.

2. What is used in performing this task? (Note if only certain items must be used. If there is choice, include everything or the kinds of things chosen among.)

X-ray requisition form,pt's chart;prior films;view boxes;prepared barium or other contrast enema;fluoroscope,TV monitor,spot film device,table;cine camera and projector or videotape,tape player;gown,gloves; pen;telephone;protective lead garments;enema tube, clamp;immobilization devices;shielding;barium paste; tape; emergency cart; chair, bedpan, bag or towels

3. Is there a recipient, respondent or co-worker involved in the task? Yes...(X) No...( )

4. If "Yes" to q. 3: Name the kind of recipient, respondent or co-worker involved, with descriptions to indicate the relevant condition; include the kind with whom the performer is not allowed to deal if relevant to knowledge requirements or legal restrictions.

Pediatric pt.to undergo defecography;accompanying adult; referring physician; pediatrician; radiologist; radiologic technologist; nurse

5. Name the task so that the answers to questions 1-4 are reflected. Underline essential words.

Conducting defecography of pediatric patient by deciding whether to go ahead;reassuring pt.;deciding on contrast material;supervising or conducting administration of enema;viewing on TV monitor;taking cine, spot films or videotape;ordering radiographs;supervising evacuation;taking cine or video and spot films;ordering post-evacuation films;deciding when examination is completed by viewing radiographs; recording medical impressions, orders for follow-up care; notifying MD of emergency signs.

List Elements Fully

Performer receives the x-ray requisition form and medical information for a pediatric patient scheduled for defecography (contrast enema study of anorectal region during defecation).

1. Performer reads the patient's requisition form and relevant information to become familiar with the case or to review materials seen earlier. Notes patient's age, sex, size, and any diagnostic information already collected.
   a. Performer notes the nature of the suspected condition and suspected location. Studies prior plain films or films of prior study on view boxes to note the extent to which the condition has been visualized.
   b. Notes whether the patient has an ileostomy or colostomy.
   c. Notes whether the patient's age, presenting condition, or the nature of the expected pathology requires or contraindicates a preparatory cleansing enema, prior abstinence from food and drink, and what was ordered.
   d. Performer notes whether the patient's condition requires a contrast medium other than a barium sulphate mixture, with or without saline.
   e. Performer notes any other relevant medical information such as whether pa-

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6. Check here if this is a master sheet..(x)

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tient has an infectious or communicable condition, or has any related conditions which might be contraindications to the procedure.

f. Performer notes whether patient has an intravenous infusion in place to prevent dehydration. May ask for or check electrolyte level.

g. Performer checks to see that an authorized adult has signed a consent for the procedure. If not, arranges to have this done at once if emergency; may have examination delayed until consent is obtained or decides to obtain personally.

h. Performer notes whether orders for prior preparation of patient have been carried out (such as prior abstinance from food and drink for a given period of time, prior administration of cleansing enema, sedation or other medication). If not, has this done and/or has patient rescheduled as appropriate.

i. Performer may call referring physician to discuss case or to obtain additional information. Notes whether pediatrician will be in attendance with patient during procedure (in case of serious illness).

2. Performer greets any non-infant patient, accompanying adult and pediatrician (if present) in examination room.

a. Performer reassures patient and/or adult with patient. Explains what will be done. Answers questions. With child, may instruct and rehearse patient in the procedures to be followed so as to obtain patient's cooperation.

b. Performer questions accompanying adult, and/or patient about patient's current symptoms in relation to the condition being studied. May examine patient. May collect additional relevant medical history. May discuss

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with referring physician. Notes whether patient is able to sit up.

c. Performer makes sure that anyone remaining in room is properly shielded.

d. If appropriate, performer obtains written consent for procedure from authorized adult. Explains the procedure and the risks involved. (Does not proceed unless there is a signed consent.)

3. Performer may order a scout film. Views when ready or views scout film already prepared by technologist. If the technical quality of the scout film is not acceptable, indicates the needed adjustments in position or technique to technologist. Notes relevant information for conducting procedure.

4. Performer considers whether there are contraindications to going ahead with the procedure based on clinical information (and scout film if obtained). May discuss patient's current condition and steps to be taken with referring physician.

5. If performer decides not to proceed, records reasons and any recommendations on patient's chart. Informs appropriate co-worker. If appropriate, orders rescheduling of patient or scheduling for alternative procedure.

6. If performer decides to proceed:

a. Performer decides on and orders the contrast material to be used, such as barium sulfate mixture or iodine based water soluble agent, or other liquid medium. Has enema and other equipment needed for defecography checked and prepared for use.

b. Performer decides on use of spot filming, cineradiography, and/or videotape. As appropriate, has tech-

TASK DESCRIPTION SHEET (continued)

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nical factors set for fluoroscopy. Has cassette inserted for spot films. Chooses full, half or quarter format and sets as appropriate. (If roll film attachment, checks that attachment is loaded with film or has this done.) Performer has videotape and/or cineradiography camera and film prepared for use. Indicates rate and frame settings for cine.

c. Performer has patient prepared, immobilized, shielded, and positioned for enema. May decide to immobilize personally. Dons protective lead garments and gown and gloves.

7. Performer returns to patient in x-ray room when informed that patient and materials are ready.

   a. If patient is able to comprehend, performer talks about what is to be done and why. Attempts to alleviate patient's fears and develop confidence. Answers patient's questions. Makes sure patient understands that he or she is to retain enema until told to evacuate by performer.
   b. Checks whether patient has been properly positioned, shielded and immobilized. Indicates adjustments needed or decides to adjust personally.
   c. Makes sure that an infant patient is kept adequately warm.
   d. If patient has an IV drip in place, makes sure that this has not been disturbed and that patient is not in distress.
   e. Performer remains alert to patient's condition throughout the procedure.
   f. Performer checks that all materials needed are present, that emergency cart is present. Checks staff shielding. Has any missing objects brought.
   g. Checks that enema has been prepared and hung at proper height near patient. Has it checked by having some of the mixture run through tubing.

List Elements Fully

   h. Prepares fluoroscope unit for monitoring by positioning unit so that the patient's pelvic area will be visible. May check by activating, readjusting, and shutting fluoroscope.

8. Performer orders or checks that patient has had body markings made with thick barium suspension (paste) in the middle of the natal cleft, perineum, and the anal dimple.

9. Performer directs insertion or inserts the enema tip or catheter as follows:

   a. Performer indicates to subordinate when to insert the enema tip into the patient's rectum and position patient in appropriate position for fluoroscopy.
   b. With pediatric patient suffering from obstruction in the aganglionic segment of bowel, has enema tip inserted only a short distance.
   c. Has technologist or nurse "sandwich" the buttocks together firmly with non-opaque adhesive tape to help retain the enema.
   d. If patient has colostomy or ileostomy, performer decides whether to opacify through the rectum or stoma. If the stoma, performer removes drainage bag and dressing or has this done. Inserts enema tip through the stoma. Plans to evaluate evacuation function of post-stomal bowel and rectum.

10. Performer may have lights in room dimmed; positions fluoroscope unit, adjusting position by viewing on TV monitor.

11. Performer indicates to technologist when to start the flow of the contrast solution by opening the enema clamp or does personally. Indicates rate of

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flow depending on condition being studied. Performer indicates throughout procedure when to reclamp enema, when to let it flow, and when to reclamp. Has flow stopped when the barium column has reached the desired level.

a. Performer watches the flow of the solution through the large intestines by activating the fluoroscope and watching on the TV monitor. Judges when to activate videotape and/or cine attachments of fluoroscope.
b. Performer observes the flow of the solution through the rectum, sigmoid and descending colon and proximal areas as decided, concentrating on areas of suspected pathology. Performer observes structures and movement. May reassure patient and encourage to retain enema. May move fluoroscope unit or table to obtain other views. Watches to be sure that pressure of enema is not excessive. May make notes while observing.
c. While observing, performer decides what to record by taking spot films. Instructs patient when to remain motionless for spot film exposures and when to resume normal breathing and relax. As decided, performer switches from cine to spot film mode as appropriate; activates spot film attachment and foot pedal for radiography. If cassette attachment, may have technologist remove cassette as spots are taken and insert additional cassettes, or does so personally.
d. Performer notes patient's reactions throughout procedure for signs of adverse reactions; may decide to provide emergency care. If the patient is unable to retain the enema or is not tolerating the procedure, performer may decide to terminate.

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May record any relevant observations on appropriate form; notifies appropriate staff.

12. Performer decides when to stop administration of enema. Deactivates videotape and/or cine cameras. If patient is able to comprehend, reminds patient to retain enema and asks patient how he or she is feeling.

13. Performer has technologist position patient for pre-evacuation overhead films. May lift infant and hold in inverted position for several minutes before filming if appropriate.

Performer has spot films and radiographs processed at once and examines on view boxes. Judges whether the technical factors and positioning are adequate for satisfactory interpretation. Indicates needed adjustments.

14. Performer has patient retain enema (or feces if no enema has been given after opacification of the anal canal). Performer continues as follows:

a. If patient cannot be placed in a sitting position, performer has a disposable adhesive bag attached to patient, has a radiolucent bedpan provided,or, with infant, provides towels. Has patient positioned on table with table tilted to appropriate angle or does so personally.
b. If patient can sit, has patient placed on an appropriate chair or pot fitted with a disposable bag.
c. Performer explains to non-infant patient that he or she is to try to defecate when requested, and to strain to help if appropriate. Performer reassures patient who shows

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signs of embarrassment. Indicates that the room lights will be out.

d. Performer adjusts fluoroscopic unit and/or videotape or cine camera.
e. When ready, performer has any tape on buttocks removed; has enema tube removed, and has room darkened.
f. Performer asks patient to evacuate. Watches on TV monitor, and activates cine or videotape attachments as process begins.
g. Performer notes dynamic movements in anorectal region. May take spot films of the structures involved in defecation at rest phase, opening phase and closing phase,or has overheads taken in relevant sequence.
h. Performer may ask patient to carry out voluntary movements such as straining and/or contracting anus.
i. If patient is an infant, performer may apply manual pressure as appropriate to initiate evacuation.
j. Has bag, towel or container removed after evacuation.

15. If post-evacuation films are to be taken to provide detailed information on the colonic mucosal pattern, performer carries out immediate cine and/or spot filming or orders overheads at once.

    a. Positions patient as appropriate for fluoroscopy, and/or indicates views for overheads.
    b. Performer has the post-evacuation films processed at once.

16. Performer views all the radiographs and spot films taken on view boxes. May replay any parts of the videotape. Determines whether the films are technically adequate to demonstrate the area and condition under study and provide sufficient information to make possible a competent medical interpretation. Performer may ask opinion of clinician or another radiologist.

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17. When performer has determined that the examination has been completed, indicates this to appropriate staff.

    a. Performer has patient cleansed; has room and equipment cleaned with antiseptic solution; has any other appropriate clean up procedures followed to avoid infection or contamination.
    b. If patient has a colostomy or ileostomy has a fresh drainage bag and dressing applied or decides to do personally.
    c. May have an infant provided food and drink immediately.

18. If performer judges that any emergency signs are in evidence, performer notifies patient's physician. Notifies physician or surgeon of preliminary findings if so requested.

19. Performer may record impressions of procedure on patient's chart:

    a. Preliminary findings.
    b. How patient tolerated procedure.
    c. Any special nursing follow-up recommended.
    d. May sign chart or requisition sheet.

TASK DESCRIPTION SHEET

Task Code No. 456

This is page 1 of 6 for this task.

1. What is the output of this task? (Be sure this is broad enough to be repeatable.)

Decision made on whether to go ahead;pt.reassured; pt.administered barium enema under diagnostic pressure and fluoroscopic control; spot films,cine and/or video records made;decision made on use of hydrostatic pressure for reduction of intussusception;enema administered under therapeutic pressure and fluoroscopic control;overhead films, post-evacuation films ordered;complete set of radiographs approved; extent of reduction,medical impressions and follow-up care recorded;MD notified of emergency signs.

2. What is used in performing this task? (Note if only certain items must be used. If there is choice, include everything or the kinds of things chosen among.)

X-ray requisition form and patient's chart;prior films;view boxes;prepared barium enema;fluoroscope, TV monitor,spot film device,table;cine camera and projector or videotape and tape player;gown;gloves; pen;telephone;protective lead garments;pressure regulator; syringe,tube,clamp,enema nozzles;immobilization devices;shielding; tape; emergency cart

3. Is there a recipient, respondent or co-worker involved in the task? Yes...(X) No...( )

4. If "Yes" to q. 3: Name the kind of recipient, respondent or co-worker involved, with descriptions to indicate the relevant condition; include the kind with whom the performer is not allowed to deal if relevant to knowledge requirements or legal restrictions.

Pediatric patient with suspected intussusception; accompanying adult; surgeon; radiologic technologist; referring MD; radiologist; nurse

5. Name the task so that the answers to questions 1-4 are reflected. Underline essential words.

Conducting diagnosis and hydrostatic reduction of intussusception of pediatric pt. by examining pt., scout films;deciding whether to go ahead;reassuring pt.;administering barium enema under fluoroscopic control;spot filming;locating and diagnosing intussusception;deciding with surgeon whether to proceed with therapeutic pressure;applying hydrostatic pressure with enema under fluoroscopic control;deciding with surgeon to repeat or terminate;ordering radiographs,post-evacuation films;approving complete set of radiographs;recording medical impressions,follow-up care;notifying MD of emergency signs.

List Elements Fully

Performer receives the x-ray requisition form and medical information for a pediatric patient scheduled for radiographic diagnosis of intussusception (invagination of one portion of the intestinal tract into the lumen of an immediately adjoining part, forming at least three cylinders), with possible reduction (correction) using hydrostatic pressure with barium enema.

1. Performer reads the patient's requisition form and relevant information to become familiar with the case or to review materials seen earlier. Notes patient's age, sex, and any diagnostic information already collected.
   a. Performer notes the history of the suspected condition, whether chronic and/or acute, the extent, and the suspected location. Studies prior plain films or films of prior study on view boxes to note the extent to which the condition has been visualized and its history (its descent and/or its partial regression).
   b. Performer notes any indications suggesting the presence of pulmonary lesions, peritoneal infections or other pathological conditions that might be contraindications to the procedure.

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6. Check here if this is a master sheet..(x)

TASK DESCRIPTION SHEET (continued)

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c. Performer notes whether prior procedures have been ordered such as abstinance from food or drink for a given period, sedation, and/or administration of IV infusion to run throughout procedure. Notes whether orders have been carried out. If not, has these done and/or has patient rescheduled as appropriate.

d. Performer notes any other relevant medical information such as whether patient has an infectious or communicable condition.

e. Performer checks to see that authorized adult has signed a consent for the procedure. If not, arranges to have this done or have examination delayed until consent is obtained, or decides to obtain personally.

f. Performer may call referring physician and/or surgeon to discuss case. Makes sure that a surgeon will be in attendance at the procedure or on call.

2. Performer greets any non-infant patient, accompanying adult and surgeon (when present) in examination room.

a. Performer reassures patient and/or adult with patient. Explains what will be done. Answers questions. May instruct and rehearse patient in the procedures to be followed so as to obtain patient's cooperation.

b. Performer questions accompanying adult and/or patient about patient's current symptoms in relation to the condition being studied. May collect additional relevant medical history.

c. Performer may manually examine patient's abdomen, palpating to feel the location and extent of the mass involved, and note signs of stiffness, swelling. Notes any symptoms of conditions which contraindicate the procedure.

List Elements Fully

d. Performer may ask the opinion of the attending surgeon.

e. If appropriate, performer obtains written consent for procedure from authorized adult. Explains the procedure and the risks involved. (Does not proceed unless there is a signed consent.)

f. Performer makes sure that anyone remaining in room is properly shielded.

3. If not already done, performer orders preliminary films of the abdominal area. May specify views. Examines scout films on view boxes as soon as they are processed:

a. Performer inspects scout films to see whether technical quality of films is acceptable. If the technical quality of the scout films is not acceptable, performer indicates the needed adjustments in position or technique to technologist.

b. Performer notes whether there are signs of obstruction and/or fluid in the abdominal cavity; checks for signs indicating the location of the intussusception, checks for signs of other pathological conditions.

4. Performer considers whether there are contraindications to going ahead with the procedure based on clinical information and evidence on scout films. May discuss patient's current condition and steps to be taken with referring physician and/or surgeon.

5. If performer decides not to proceed, records reasons and any recommendations on patient's chart. Informs appropriate co-worker. If appropriate, orders rescheduling of patient or scheduling for alternative procedure.

TASK DESCRIPTION SHEET (continued)

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6. If performer decides to proceed:
   a. Orders barium sulfate enema with appropriate amount of contrast fluid. Selects height at which enema should be hung; has equipment checked to be sure that a free flow will be available. Orders soft catheter for insertion. Orders additional materials as appropriate.
   b. Performer has technical factors set for fluoroscopy. Has cassette inserted for spot films. Chooses full, half or quarter format and sets as appropriate. (If roll film attachment, checks that attachment is loaded with film or has this done.)
   c. May decide to utilize videotape and/or cineradiography to observe filling and peristaltic motions. If so decided, has videotape and/or cine camera checked and prepared. Indicates rate and frame settings for cine.
   d. Performer has patient prepared, immobilized, shielded and positioned for enema. May decide to immobilize personally. Dons protective lead garments and gown and gloves when appropriate.

7. Performer returns to patient in x-ray room when informed that patient and materials are ready.
   a. If patient is able to comprehend, performer talks to patient about what is to be done and why. Attempts to alleviate patient's fears and develop confidence. Answers patient's questions. Makes sure patient understands that he or she is to retain enema until told to evacuate by performer or technologist.
   b. Checks whether patient has been properly positioned, shielded and immobilized. Indicates adjustments needed or decides to adjust personally.

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   c. Makes sure that patient is being kept adequately warm.
   d. If patient has an IV drip in place, makes sure that this has not been disturbed and that patient is not in distress.
   e. Performer remains alert to patient's condition throughout the procedure.
   f. Performer checks that all materials needed are present, that emergency cart is present. Checks staff shielding. Has any missing objects brought.
   g. Checks that barium enema has been prepared and hung at proper height near patient. If not already done, has it checked by having some of the mixture run through tubing.
   h. Prepares fluoroscope unit for monitoring by positioning unit so that the patient's pelvic area will be visible. May check by activating, readjusting and shutting fluoroscope.

8. Performer inserts soft catheter of enema personally or directs insertion:
   a. Performer indicates to subordinate when to insert the enema tip into the patient's rectum and position patient in appropriate position for fluoroscopy.
   b. Has technologist or nurse tape the buttocks together (after insertion of tip) as tightly as possible, using a non-opaque tape.

9. Performer proceeds with the diagnostic phase of the barium enema procedure:
   a. Performer indicates to technologist the enema pressure to use for the diagnostic phase (by adjusting height of enema or regulating pressure mechanically).
   b. Performer may have lights in room dimmed; positions fluoroscope unit.

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c. Performer indicates to technologist when to start the flow of the contrast solution by opening the enema clamp.

d. Performer watches the flow of the barium mixture through the large intestines by activating the fluoroscope and watching on the TV monitor. Judges when to activate videotape and/or cine attachments of fluoroscope. Indicates when to reclamp enema, when to let it flow, and when to reclamp.

e. Performer moves patient, table or fluoroscope unit as needed to optimally project on the TV monitor the different portions of the colon as they are filled, particularly the flexures. While observing, performer decides what to record by taking spot films. Instructs patient when to remain motionless for spot film exposures and when to resume normal breathing and relax. As decided, performer activates spot film attachment and foot pedal for radiography (switching from cine mode). If cassette attachment, may have technologist remove cassette as spots are taken and insert additional cassettes, or does so personally.

f. Performer observes structures and movement. May reassure patient and encourage to retain enema. Watches to be sure that pressure of enema is not excessive. May make notes while observing.

g. If there are any signs of filling defects or of perforation of the intestinal wall, performer decides with surgeon at once whether to terminate procedure. May decide to assist in administering emergency care.

h. Unless performer observes contraindications, performer continues to have the contrast fluid flow until the barium column has filled the colon and cecum and passed through the ileocecal valve into the small intestines in order to be sure of adequate diagnostic information.

i. When the performer is satisfied that the filling has progressed as far as needed, shuts fluoroscope and has enema clamped.

j. Performer may order overhead radiographs. If so, specifies what is needed. Reassures patient and encourages to retain enema. Has spot films and radiographs processed at once.

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10. Performer views radiographs and spot films on view boxes; may replay videotape.

a. Performer determines whether the films are technically adequate to demonstrate the area and condition under study and provide sufficient information to make possible a competent medical interpretation. Performer may ask opinion of surgeon or another radiologist.

b. If patient has had difficulty retaining enema, performer may decide to let more fluid flow or to repeat radiography to gain further information. If so, indicates what is needed and repeats appropriate steps.

c. Performer decides whether the condition being demonstrated is a true intussusception and, if so, its start and the extent of the intestinal tissues involved.

    i) If performer decides that another condition is demonstrated, records as appropriate and consults with surgeon on appropriate next steps. If appropriate, terminates procedure as described below.

    ii) If performer decides that an intussusception has been dem-

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List Elements Fully

onstrated, performer studies the structures involved, particularly the location of the apex. Discusses with surgeon whether hydrostatic pressure is contraindicated or likely to be of therapeutic value. Decides whether to go ahead with therapy.

11. If performer decides to go ahead with the therapeutic use of the barium enema, proceeds as follows:

    a. Performer indicates to technologist whether to allow the barium column to reflux into enema for reuse or to use remaining enema fluid (if there is enough). Indicates the pressure desired for use by selecting height for enema or mechanically regulating pressure. Selects a safe pressure that is judged adequate to force the apex back and reduce the intussusception.
    b. Performer positions patient, fluoroscope unit, and table for viewing the effect of the hydrostatic pressure. When ready, activates fluoroscope (and cine and/or videotape if so decided). Has enema clamp released and observes flow on TV monitor.
    c. Performer observes the response of the apex to the hydrostatic pressure. May increase pressure to assist (such as at the moment when the intussusception is to be brought back through the ileocecal valve). Stays alert for signs of excessive pressure and decreases pressure at once. May make spot films while observing.
    d. Performer determines during therapeutic procedure whether the attempt at reduction should be continued and/or repeated as described above, based on the history of the condition, the patient's current condition, the stage of the reduction, and the location of the intussusception. May decide to continue with patient in another position.
    e. Performer judges whether the intussusception has been reduced through the ileocecal valve. If so, allows barium to flow into the small intestines until performer judges that no ileo-ileal intussusception can remain. Opacifies major portion of small bowel while observing on TV monitor. Judges extent of filling of unobservable portions by noting amount of barium solution used in relation to patient's size.
    f. Consults with surgeon. At any point performer and surgeon may decide to discontinue procedure and have patient prepared for surgery. If there is any sign that the intestinal wall has been perforated, has patient taken at once to surgery.

12. Performer decides when to terminate application of hydrostatic pressure. Shuts fluoroscope and turns off cine or videotape. Clamps enema.

    a. Performer reassures patient and indicates what will occur next. Indicates to technologist whether post evacuation films will be made.
    b. Has tape removed. Has patient allowed to evacuate enema.
    c. Performer orders post-evacuation overhead films. Indicates what views are needed depending on the location being studied. Has post-evacuation films processed at once.
    d. Performer has patient cleansed afterwards and has room and equipment cleaned with antiseptic solution; has other appropriate clean up procedures followed to avoid in-

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List Elements Fully	List Elements Fully
fection or contamination. e. May have an infant provided food and drink immediately. 13. Performer reviews all the radiographs as above. Notes especially whether there has been a complete or partial reduction of the intussusception, the position under pressure and the site after evacuation. a. If performer decides that only a partial reduction has been accomplished, performer considers whether to have patient referred for surgery. b. Notifies physician or surgeon of preliminary findings if so requested. c. If performer judges that any emergency signs are in evidence, performer notifies patient's physician at once. 14. Performer may record impressions of procedure on patient's chart: a. Preliminary findings as described above. b. How patient tolerated procedure. c. Any special nursing follow-up recommended. d. May sign chart or requisition sheet.	

TASK DESCRIPTION SHEET

Task Code No. 457

This is page 1 of 4 for this task.

1. What is the output of this task? (Be sure this is broad enough to be repeatable.)

Decision made whether to use fluoroscopy for inspiration-expiration study;patient reassured;patient observed under fluoroscopy;pathology or foreign body evidence noted;spot films,video and/or cine records made if so decided;discussion held with surgeon if appropriate;medical impressions,orders,follow-up care recorded;MD notified of emergency signs.

2. What is used in performing this task? (Note if only certain items must be used. If there is choice, include everything or the kinds of things chosen among.)

X-ray requisition form, patient's chart,prior radiographs, medical records;view boxes;pen;telephone; requisition forms;fluoroscope,table,TV monitor,spot film,cine and/or videotape attachments;protective lead garments;cine projector and screen;shielding; immobilization devices

3. Is there a recipient, respondent or co-worker involved in the task? Yes...(X) No...( )

4. If "Yes" to q. 3: Name the kind of recipient, respondent or co-worker involved, with descriptions to indicate the relevant condition; include the kind with whom the performer is not allowed to deal if relevant to knowledge requirements or legal restrictions.

Pediatric patient;accompanying adult;referring MD; surgeon;radiologist;radiologic technologist

5. Name the task so that the answers to questions 1-4 are reflected. Underline essential words.

Conducting fluoroscopic inspiration-expiration examination of pediatric patient by deciding whether to go ahead;reviewing history;reassuring pt.;observing inspiration and expiration under fluoroscopic control;deciding whether to take spot films and/or cine or videotape record;looking for evidence of pathology or foreign body;showing radiographic record and discussing with surgeon if appropriate;recording medical impressions,orders,follow-up care;notifying MD of emergency signs.

List Elements Fully

Performer receives the x-ray requisition form and medical information on a pediatric patient scheduled for inspiration and expiration radiography (non-contrast radiography of thoracic organs such as heart, thymus, lungs and mediastinum) as a result of:

a. Prior decision to perform examination using fluoroscopy because of unusual lung findings on prior radiographs, "unresolved" pneumonia, non-confirmed radiographs in a case of suspected foreign body.

b. Prior decision to perform examination using fluoroscopy because patient is known to be unable to cooperate to provide radiographs in full inspiration and full expiration.

c. Radiologic technologist reporting to performer that he or she is unable to obtain radiographs in full inspiration and full expiration.

1. Performer reads the patient's requisition form and relevant information to become familiar with the case (if study was routinely ordered) or to review materials seen earlier.
   a. Notes patient's age, sex, and any diagnostic information already collected.
   b. Notes surrounding circumstances, history and suspected location of the obstruction and/or foreign

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6. Check here if this is a master sheet..(X)

Task Code No. 457

This is page 2 of 4 for this task.

List Elements Fully

body, and the nature of any suspected foreign body or obstruction.

c. If prior plain films of the patient are available, performer places on view boxes. Reviews or evaluates in order to assess technical quality and/or become familiar with appearance of the area of interest.

d. Performer may call referring physician to discuss case or to obtain additional information.

e. If radiologic technologist was unable to obtain adequate radiographs, discusses problem with technologist; reviews any plain films of the chest already obtained. Performer considers whether patient should undergo fluoroscopy or whether procedures should be used to try to obtain overhead radiographs. If the latter, indicates to technologist what to do. May record.

f. If performer will proceed with fluoroscopy, has materials and equipment prepared and technical factors set for fluoroscopy, spot filming, videotape and/or cineradiography as decided.

    i) Has cassette inserted for spot films. Chooses full, half or quarter format and sets as appropriate. (If roll film attachment, checks that attachment is loaded with film or has this done.)

    ii) Performer has videotape and/or cineradiography camera and film prepared for use if dynamic functions may be recorded. Indicates rate and frame settings for cine.

2. Performer greets any non-infant patient and accompanying adult (if present) in examination room:

List Elements Fully

a. Performer attempts to calm and reassure patient. Explains what will be done to child or adult with patient. Answers questions. With child, may instruct and rehearse the procedures to follow so as to obtain patient's cooperation.

b. Performer questions accompanying adult and/or patient about current symptoms in relation to the condition being studied. May examine patient. May collect additional relevant history, particularly if foreign body is suspected.

c. Performer has patient prepared, immobilized, shielded, and positioned, or decides to immobilize and position personally.

d. Performer dons protective lead garments and gloves when appropriate.

e. If anyone is to remain in examination room, performer makes sure that he or she is properly shielded.

3. When informed that patient and equipment are ready, performer checks whether patient has been properly positioned, shielded and immobilized. Indicates adjustments needed or decides to adjust personally.

a. Performer places the fluoroscopic unit in front of or over patient so that the thoracic organs will be visible.

b. May ask child old enough and able to cooperate to breathe deeply in and/or out on signal.

c. When ready for fluoroscopy, performer may have lights in room dimmed; turns on fluoroscope or has this done. Adjusts unit for viewing on TV monitor.

d. Performer signals to patient (if he or she can cooperate) when to breathe as rehearsed. Moves the table and/or patient or has the patient move as appropriate to obtain all required views while observing on the TV monitor.

TASK DESCRIPTION SHEET (continued)

Task Code No. 457

This is page 3 of 4 for this task.

List Elements Fully

4. Performer observes the appearance of the organs during inspiration and expiration. Looks for signs of bronchial obstruction, localized hyperaeration (overaeration),or segmental collapse as evidence of specific types of opaque or nonopaque foreign bodies; notes any displacement of the heart and/or mediastinal structure, or tension and/or widening of the rib interspaces.

   a. If performer decides that there is need for permanent radiographic information, may decide to make spot films. If so, activates spot film attachment and x-ray foot pedal as appropriate. If cassette attachment, may have technologist remove cassette as spots are snapped and insert additional cassettes, or does so personally.
   b. If performer decides that there is need for record of dynamic function, may decide to use cine or videotape. If decided, performer activates cine or videotape camera.
   c. If using videotape, performer may, at any point in the process, interrupt the procedure, press the return tape and have the tape projected on screen. Examines replay for clarification of what was seen. Advances again and proceeds with procedure when appropriate. May have surgeon called to view replay.
   d. Has patient exposed to radiation only while performer is actually viewing and filming.
   e. Performer remains alert to the patient's condition and reaction to the procedure. Notes any signs of respiratory distress or adverse reaction. May decide to provide emergency care as required.
   f. Once the performer decides that the fluoroscopic examination is completed, has spot films, and/or cine films processed at once.

List Elements Fully

   g. Reassures patient and has patient relax while performer continues with procedure.

5. Performer looks at the processed spot films and cine film on view boxes or projected on cine screen as soon as they are ready. May have surgeon called to view these as well. May rerun videotape.

   a. Performer determines whether the radiographic information is technically adequate to demonstrate the area and condition under study and provide sufficient information to make possible a competent medical interpretation. May ask opinion of another radiologist, or discusses with surgeon.
   b. Performer may decide to recommend additional diagnostic procedures. If so, may record on appropriate form.
   c. Performer may be able to conclude the presence and location of a particular type of foreign body. If so, may recommend or order procedure for removal. Fills out appropriate form.
   d. If performer judges that any emergency signs are in evidence, performer notifies patient's referring physician or surgeon at once if not already done.

6. Performer determines when the radiographic examination is completed. Returns to patient:

   a. Informs technologist that he or she can terminate the procedure.
   b. Makes sure that patient is in the care of a staff person who will transport to appropriate next location.
   c. Performer may order delayed film(s) to be taken after a proper elapse

TASK DESCRIPTION SHEET (continued)

Task Code No. 457

This is page 4 of 4 for this task.

List Elements Fully	List Elements Fully
of time. If so, may fill out appropriate requisition and/or has this done. d. Performer may record impressions of procedure on patient's chart: i) Preliminary findings. ii) Any special surgery, nursing follow-up recommended, further radiography ordered. iii) May sign chart, requisition sheet.	

TASK DESCRIPTION SHEET

Task Code No. 458

This is page 1 of 2 for this task.

1. What is the output of this task? (Be sure this is broad enough to be repeatable.)

Radiographic and related diagnostic materials on pediatric patients read, interpreted; medical and/or developmental conclusions drawn and recommendations made orally or dictated; patient's physician called about emergency signs; selected radiographs earmarked for study or library use; material rejacketed; report placed for typing.

2. What is used in performing this task? (Note if only certain items must be used. If there is choice, include everything or the kinds of things chosen among.)

X-ray requisition forms; current radiographs, videotape and/or cine film and other diganostic information; view boxes; cine or videotape projector and screen; prior and collateral radiographic materials such as results of bone age study; telephone; dictation equipment; pen; magnifying glass; ruler; projector; anatomical reference chart

3. Is there a recipient, respondent or co-worker involved in the task? Yes...(X) No...( )

4. If "Yes" to q. 3: Name the kind of recipient, respondent or co-worker involved, with descriptions to indicate the relevant condition; include the kind with whom the performer is not allowed to deal if relevant to knowledge requirements or legal restrictions.

Co-workers; pediatricians; surgeons; referring physician

5. Name the task so that the answers to questions 1-4 are reflected. Underline essential words.

Reading, interpreting and making recommendations on radiographic and related studies of pediatric patients or giving opinions to clinicians or co-workers by reviewing relevant medical information and requisition sheet(s); evaluating current and prior films and collateral diagnostic materials for medical and developmental information; notifying referring physician of emergency signs; explaining opinions or dictating findings and recommendations; placing report for typing.

List Elements Fully

Performer reads and interprets completed radiographs of examinations and procedures performed on pediatric patients, or provides opinions to co-workers, pediatricians, or surgeons when requested on interpretation and conclusions regarding radiographic materials dealing with pediatric patients.

1. If responding to request, performer goes to where radiographic material is on view. (on view boxes or cine or videotape projected on screen). Listens while co-worker explains problem regarding how to proceed next, or problem of interpretation.

   If reading and interpreting completed work, performer obtains the jacketed radiographic work-ups. Includes the current set of radiographs, related diagnostic materials, cine and/or videotape, any results of bone age study (if appropriate), the relevant requisition sheets, and other prior studies if available. Goes to reading area and sets up radiographic materials on view boxes or prepares to project cine film or videotape on screen.

2. Asks about, reads, or reviews x-ray requisition forms and materials on patient's medical history, age, sex, size, and whether premature. Notes the reason for the study, the presenting symptoms, the sus-

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6. Check here if this is a master sheet..(X)

TASK DESCRIPTION SHEET (continued)

Task Code No. 458

This is page 2 of 2 for this task.

List Elements Fully

pected pathology, any related conditions, the details of the study ordered, decisions on technique, any notes made during the procedure, and the preliminary medical impressions recorded directly after the procedure (if viewing completed results). Reviews any relevant prior reports or asks to see these and prior radiographs. Reviews results of bone-age studies if relevant.

3. Performer reads and interprets the radiographs, noting the appearance of the organs being studied, indications of pathological conditions, signs of obstruction, constriction or stenosis in the vessels or organs, malformation of the bones, spine and skull.
   a. Performer considers the sex and age of the child in examining for signs of structural or developmental deformities or anomalies.
   b. In infants and neonates performer may pay particular attention to the amount and distribution of gas in the gastrointestinal tract.
   c. Looks for evidence of pathological conditions which might explain the presenting symptoms beyond those suggested by the requisition sheet.
   d. Performer may consult standard references indicating developmental stages such as anatomical reference charts; may use ruler, protractor, magnifying glass.

4. Performer decides what to report and/or explain:
   a. Performer decides whether any abnormalities, changes, or suspicious signs warrant the immediate attention of the patient's physician. If so, telephones at once and discusses findings (or recommends that co-worker in charge of case do this).

List Elements Fully

   b. For own work performer decides what to report and what recommendations to make based on the type of information requested and the information revealed by the radiographs and related materials.
   c. In response to request, decides what to recommend to co-worker. Explains interpretation and recommendations verbally, indicating how conclusions were arrived at, including medical and technical considerations.
   d. Performer dictates findings (for own work) by explaining what appears on the films. Describes worrisome or suspicious signs, abnormalities and/or changes or lack of growth in patient over time; refers to earlier films as appropriate. (Might indicate presence of artifacts which do not have medical significance). Indicates what implications can be drawn from findings and what conclusions and/or courses of action are warranted or contraindicated, including need for additional studies, tests, or courses of treatment.

5. Performer may decide whether any of the material is unusual or of special interest and warrants inclusion in museum library or should be used for study purposes. Marks jackets appropriately if so decided so that duplicates can be made.

6. Returns own patient's radiographic material, requisition sheet and tape of dictation to proper jacket, and places to be picked up for typing.

TASK DESCRIPTION SHEET

Task Code No. 459

This is page 1 of 2 for this task.

1. What is the output of this task? (Be sure this is broad enough to be repeatable.)

Presentation prepared and made on pediatric radiology developments or case studies; presentations of surgeons, pediatricians or radiologists listened to; discussions participated in; conference opened, conducted, and closed, when appropriate.

2. What is used in performing this task? (Note if only certain items must be used. If there is choice, include everything or the kinds of things chosen among.)

Radiographic and medical equipment; radiographic materials; case histories; view boxes; slide projectors

3. Is there a recipient, respondent or co-worker involved in the task? Yes...(X) No...( )

4. If "Yes" to q. 3: Name the kind of recipient, respondent or co-worker involved, with descriptions to indicate the relevant conditions; include the kind with whom the performer is not allowed to deal if relevant to knowledge requirements or legal restrictions.

Surgeons; pediatricians; radiologists

5. Name the task so that the answers to questions 1-4 are reflected. Underline essential words.

Participating in meetings of radiologists, surgeons and pediatricians to discuss new developments, cases of interest, and case problems in the field of pediatric surgery and radiology by planning and presenting new developments in the radiologic field, interesting case studies, or problems in current cases, and/or deciding to listen to presentations about new developments in surgery, interesting case studies, or case problems, and participating in discussions; leading conference sessions when appropriate.

List Elements Fully

Performer attends meetings of medical staff and co-workers in surgery, pediatrics and related specialties to discuss areas of mutual concern.

1. Performer may prepare presentations describing new work in the field of pediatric radiology.
   a. Performer decides what to present and in what degree of depth and detail.
   b. Decides on how to make presentation and what to use.
   c. May prepare outline, obtain special instructional materials, do research on topic for use in presentation. May have resident assist.
   d. May prepare slides from own source of radiographs or may obtain existing radiographic material and slides from library. May have resident assist.
   e. At meeting, when performer is called upon, places radiographs, spot films or other radiographic materials on view box or uses slide projector. Describes work selected, answers questions, and participates in discussion. May recommend further reading.
   f. Performer may, when appropriate, demonstrate or simulate new and/or relevant techniques, equipment or procedures.
   g. After presentation performer replaces materials

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6. Check here if this is a master sheet..(X)

TASK DESCRIPTION SHEET (continued)

Task Code No. 459

This is page 2 of 2 for this task.

List Elements Fully

and equipment or has this done.

2. Performer may attend conferences at which surgeons and/or pediatricians present case studies and raise the problems involved, or performer may choose cases which are of interest from the library or personal files which are of educational interest.

   a. Performer may be told beforehand by department head or conference leader what current or past cases will be presented for discussion, or performer will discuss the type of information to be covered in order to select relevant cases.
   b. Performer may obtain the radiographic materials related to the cases selected; may select appropriate cases. May have assistant gather materials and reviews to be sure they are appropriate.
   c. Performer reviews the radiographs and the requisition sheets involved, and any other relevant medical information such as reports and interpretations already made.
   d. Performer may make notes to use as reference, pointing out fine points with regard to interpretation of the radiographs in connection with pathological symptoms and conditions.
   e. At the conference, performer presents the radiographs involved as appropriate,and presents interpretation; makes relevant points so as to instruct the audience in the reasoning involved. Participates in the discussion as appropriate;answers questions. May suggest reference articles on subject.
   f. Performer replaces radiographic materials or has these replaced when done.
   g. If called on to lead conference, performer opens conference; calls on co-workers to present cases; leads or chairs discussions and question period; closes meeting.
   h. If current case studies are involved, performer may maintain files on the case(s) and read reports including final diagnosis and treatment prescriptions.

List Elements Fully

3. Performer may decide to attend presentation by surgeons,pediatricians or co-workers. May make notes,ask questions and/or participate in discussion.

4. Performer may decide to attend presentation about a particular case that is of interest. May make notes, ask questions and/or participate in discussion.

5. Performer may decide to present relevant problems that performer is personally having trouble with and ask for comments and suggestions from participants.

   a. Selects the case material needed to present the problem.
   b. Makes presentation and poses problems involved.
   c. Listens and participates in resulting discussions.

TASK DESCRIPTION SHEET

Task Code No. 460

This is page 1 of 2 for this task.

1. What is the output of this task? (Be sure this is broad enough to be repeatable.)

Radiology resident shown and explained procedures involved with pediatric radiography;resident evaluated for readiness to do activities under supervision;resident observed and criticized;resident evaluated for readiness to do tasks without direct supervision; resident's work spot checked and criticized; questions answered; opinions on work given as requested; evaluation noted informally.

2. What is used in performing this task? (Note if only certain items must be used. If there is choice, include everything or the kinds of things chosen among.)

X-ray requisition forms; materials and equipment needed for pediatric radiography procedures; related radiographs; view boxes; emergency equipment

3. Is there a recipient, respondent or co-worker involved in the task? Yes...(X) No...( )

4. If "Yes" to q. 3: Name the kind of recipient, respondent or co-worker involved, with descriptions to indicate the relevant condition; include the kind with whom the performer is not allowed to deal if relevant to knowledge requirements or legal restrictions.

Radiology resident to be instructed in pediatric radiography; any pt. involved; surgeons; clinicians; supervisor of residents

5. Name the task so that the answers to questions 1-4 are reflected. Underline essential words.

Providing clinical training for radiology residents in pediatric radiography by demonstrating procedures, explaining what is being done, answering questions; deciding when residents can perform tasks under direct supervision; observing and correcting; deciding when tasks can be done without direct supervision; spot checking and correcting; advising as requested or as deemed necessary.

List Elements Fully

Performer provides clinical training to residents in radiology in the area of specialized pediatric procedures, covering choice of examinations, special handling, relevant developmental knowledge, medical aspects of procedures, interpretation of radiographic material, and possible recommendations and treatments.

1. Performer provides demonstration, explanation, informal evaluation and supervision in: reading requests for radiographic studies and deciding on best procedure; what to look for; available medical and technical procedures including surgical entry, choice of contrast media, technical equipment, positions and angles, special handling and immobilization, indications, contraindications; prior preparation, sedation, anesthesia, emergency care; providing technical and medical interpretation of radiographic materials; learning range of developmental and medical conclusions that can be drawn; alternative and additional procedures and tests; therapeutic procedures; and courses of treatment to consider or perform.

2. When performer is assigned a resident, may select times, patients, and procedures to demonstrate, and may explain to resident while performer carries out own tasks.

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6. Check here if this is a master sheet..(X)

TASK DESCRIPTION SHEET (continued)

Task Code No. 460

This is page 2 of 2 for this task.

List Elements Fully

a. Performer explains what will be taught.
b. Performer may narrate the steps, may explain what is being done, or may explain the basis for decisions and actions.
c. Performer may decide to solicit questions to find out what the resident understands, may answer questions, or may elaborate on the explanation of what is being done, concentrating on the relevant skills and knowledges.
d. Performer decides when the resident has observed sufficiently and has a clear enough understanding of a procedure to carry it out under close, direct supervision and/or to assist.

3. Performer supervises and observes resident carrying out activities assigned.

a. Performer asks the resident to do all or part of a procedure and remains at the side of the patient or carries out own portion and watches the resident perform the assigned activity.
b. While observing, performer decides whether the activity is being done properly, whether there is a specific problem, whether there is need to demonstrate the procedure again or explain, and does so.
c. Performer may comment on the performance, encourage or correct as deemed necessary, or do this later.
d. Performer may decide to intervene and take over the procedure, explaining to the resident what was done incorrectly at that point or later.
e. If decision is to demonstrate again, performer may redo and have the resident observe, or have resident repeat the procedure until it is done properly.

List Elements Fully

f. Performer decides which procedures or activities can be done by the resident without direct supervision (although radiologist remains responsible). Informs proper supervisors, notes for own use, and/or tells this to resident.

4. Performer spot checks resident carrying out activities without direct supervision or responds to requests for guidance, assistance, or further instruction.

Performer proceeds as in steps 2 or 3 as appropriate, observing, noting areas needing improvement, determining nature of problem, assisting, giving opinions, answering questions, and providing further instruction on how to deal with unusual circumstances. Reinforces correct work. Suggests areas for improvement.

5. When patients are present for demonstrations, performer may explain presence of resident; when observing, performer may explain own presence.

6. Performer informally notes the extent of learning or proficiency of resident throughout the training:

a. May decide to discuss performance with resident at any time.
b. May keep records on what was taught or on resident's progress. May make personal notes for use in later evaluation meetings.

TASK DESCRIPTION SHEET

Task Code No. 461

This is page 1 of 2 for this task.

1. What is the output of this task? (Be sure this is broad enough to be repeatable.)

Outline and content planned and prepared for lecture to residents or case conference on pediatric radiology; lecture given; conference conducted by use of questions and answers.

2. What is used in performing this task? (Note if only certain items must be used. If there is choice, include everything or the kinds of things chosen among.)

Paper, pen; instructional and reading material in pediatric radiology; radiographic materials; projector and slides; cine and projector; screen; view boxes

3. Is there a recipient, respondent or co-worker involved in the task? Yes...(x) No...( )

4. If "Yes" to q. 3: Name the kind of recipient, respondent or co-worker involved, with descriptions to indicate the relevant condition; include the kind with whom the performer is not allowed to deal if relevant to knowledge requirements or legal restrictions.

Residents in radiology; program director; co-worker; library and/or clerical personnel

5. Name the task so that the answers to questions 1-4 are reflected. Underline essential words.

Planning and presenting lectures or case conferences on pediatric radiology for radiology residents by deciding on content, method of presentation; preparing material; presenting lecture, being aware of responses and adjusting presentation to students' needs; using radiographic material in question and answer format to demonstrate aspects of topics for instructional purposes.

List Elements Fully

Performer presents lecture(s) or holds case conferences on pediatric radiology for classes of radiology residents.

1. Performer is notified of assignment or decides what should be covered and at what depth and degree of detail, considering the residents' current academic level and objectives of the residency program.

2. Decides on method of presentation and plans lecture and/or case conference:

   a. Prepares outline.
   b. May obtain special instructional materials or asks co-worker to obtain for review. May use materials already prepared.
   c. May do research in topic area for use in lecture.
   d. May prepare slides from own source of radiographs (teaching cases) or may obtain existing radiographic and cine material and/or slides from library. May ask co-worker to obtain for review, or personally chooses radiographs to illustrate problem cases for a question and answer session. Performer may choose materials to contrast normal, developmental and pathological states.
   e. Decides on time to allocate for questions and answers for lecture, or may choose residents to

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6. Check here if this is a master sheet..(x)

TASK DESCRIPTION SHEET (continued)

Task Code No. [illegible].61

This is page 2 of 2 for this task.

List Elements Fully	List Elements Fully
present case material for case study conference. If so, discusses as needed. 3. At a case conference, places radiographs, spot films or other radiographic materials on view box or uses slides and projector. Shows cine film using projector and screen. May have resident(s) present material. Has residents give interpretations of materials. Throws out questions about materials; evaluates and responds to answers; or answers questions and participates in discussion about cases involved. Chooses how to present answers and comments so that residents will understand how answers were arrived at. 4. At a lecture, presents material as deemed appropriate. May note whether information is being understood, and adjust presentation accordingly. 5. Performer may recommend reading to students. 6. May make personal notes on residents for use in evaluation meeting. 7. Performer may keep material and notes prepared for future use; has materials taken from library and equipment returned.	

TASK DESCRIPTION SHEET

Task Code No. 462

This is page 1 of 2 for this task.

1. What is the output of this task? (Be sure this is broad enough to be repeatable.)

Outline and content prepared for lecture to medical students on pediatric radiology; instructional materials collected, researched or prepared; lecture given.

2. What is used in performing this task? (Note if only certain items must be used. If there is choice, include everything or the kinds of things chosen among.)

Paper, pen; instructional and reading material on pediatric radiology; slides of radiographic materials; projector; cine film, projector, screen

3. Is there a recipient, respondent or co-worker involved in the task? Yes...(X) No...( )

4. If "Yes" to q. 3: Name the kind of recipient, respondent or co-worker involved, with descriptions to indicate the relevant condition; include the kind with whom the performer is not allowed to deal if relevant to knowledge requirements or legal restrictions.

Medical students; person in charge of medical student program; resident; library and/or clerical personnel

5. Name the task so that the answers to questions 1-4 are reflected. Underline essential words.

Planning and presenting lectures on pediatric radiology for medical students by deciding on content, method of presentation; preparing material; presenting lecture, being aware of responses, and adjusting presentation to students' needs.

List Elements Fully

Performer presents lecture(s) on assigned aspect(s) of pediatric radiology to classes of medical students or others who wish to attend.

1. Performer is notified of assignment or decides what should be covered, and at what depth and degree of detail, considering the students' current academic level and curriculum objectives of medical school. May request change of time or topic and discusses with program director.

2. Decides on method of presentation and plans lecture:

   a. Prepares outline.
   b. May obtain special instructional materials or asks co-worker to obtain and reviews. May use materials already prepared.
   c. May do research in topic area for use in lecture.
   d. May prepare slides from own source of radiographs or may obtain existing slides, radiographs, or cine film from library.
   e. Performer may choose materials to contrast normal and pathological states, to contrast adult vs. pediatric procedures, or to illustrate developmental aspects of material.
   f. Decides on time to allocate for questions and answers.

OK-RP;RR;RR

6. Check here if this is a master sheet..(X)

TASK DESCRIPTION SHEET (continued)

Task Code No. 462

This is page 2 of 2 for this task.

List Elements Fully	List Elements Fully
g. May have resident select materials for review; if so, reviews. 3. Presents lecture as deemed appropriate. Attempts to note whether information is being understood and adjusts presentation accordingly. Uses instructional material, answers questions, depending on plans. Leads discussions. May recommend additional reading. 4. May make note of any outstanding students and may report this to person in charge of medical student program. May keep materials and notes prepared for future use.	

TASK DESCRIPTION SHEET

Task Code No. 469

This is page 1 of 4 for this task.

1. What is the output of this task? (Be sure this is broad enough to be repeatable.)

Decision made on approval of non-neurologic angiographic procedure for a patient;recommendations made on route,type of entry,site,contrast,equipment,prior tests,patient preparation,premedication,anesthesia;record entered of decisions,orders, and/or recommendations;record placed for scheduling;scheduling expedited if so decided.

2. What is used in performing this task? (Note if only certain items must be used. If there is choice, include everything or the kinds of things chosen among.)

X-ray requisition form;patient's chart;relevant radiographic and other diagnostic materials;telephone; view boxes;pen;dictating equipment

3. Is there a recipient, respondent or co-worker involved in the task? Yes...(x) No...( )

4. If "Yes" to q. 3: Name the kind of recipient, respondent or co-worker involved, with descriptions to indicate the relevant condition; include the kind with whom the performer is not allowed to deal if relevant to knowledge requirements or legal restrictions.

Physician requesting angiographic procedure(s);surgeon;specialist;anesthesiologist;secretary or clerk

5. Name the task so that the answers to questions 1-4 are reflected. Underline essential words.

Deciding on type of non-neurologic angiography procedure to order for any patient in consultation with referring physician,surgeon,and/or other specialist, by reviewing case history and relevant materials, discussing,considering contraindications and need; approving,recommending alternative studies,postponement,and/or refusing approval;dictating reasons for refusal if requested;if approved,recommending site, route,technique,anesthetic,patient preparation;recording orders and recommendations;placing for scheduling and/or typing;expediting if appropriate.

List Elements Fully

Performer decides on what type of non-neurologic angiography procedure to order for a patient upon receipt of a request from a referring physician on an x-ray requisition form,by phone, or in person. Request may be for one or more radiographic contrast studies of arteries and/or veins excluding the brain and spinal cord, covering blood vessels in the extremities and/or torso, angiocardiography and coronary arteriography.

1. Performer reads the x-ray requisition form and the patient's history to learn the nature of the problem, the presenting symptoms, the suspected pathology, the studies and/or procedures requested, and special requirements. Notes whether request is urgent with a need for an immediate diagnosis,or information prior to surgery.
   a. Performer notes the patient's age, sex, weight, height, the specific procedure requested,the purpose,referring physician.
   b. Performer studies the relevant medical history and recorded symptoms of the patient, the suspected nature and location of the pathology, and relevant background information. If any prior radiography or clinical tests have been carried out, performer notes results. If any relevant prior ra-

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6. Check here if this is a master sheet..(X)

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diographs, radioisotope scans or ultrasonograms are available, performer studies these and their related reports to become more familiar with the nature of the current diagnostic information.

c. Performer notes evidence of the presence of conditions which may be contraindications to the procedure requested or which would affect the choice of vascular route, contrast medium and decisions on prior preparation of the patient. Notes especially history of uremia, acute renal disease, known sensitivity to iodine, prior response to contrast media or general history of allergy, severe heart or liver disease, hypertension, problems with clotting, pulmonary edema or other potential problems.

d. Performer notes the patient's general health and probable ability to withstand the procedure; notes whether there is current emergency need for the procedure.

e. Performer notes whether patient (if female) is pregnant, is taking oral contraceptive; notes whether patient has a communicable or infectious condition.

f. If the performer finds that the information provided is inadequate, performer arranges to have other materials sent or discusses needed information with relevant physician.

2. Performer considers any contraindications in relation to the need for additional information. Considers the severity of the symptoms, the extent of definition on any current radiographs, and/or the suddenness of the appearance of the abnormalities in relation to the possible adverse affects of procedure on patient.

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a. If the condition or the nature of the request warrants it, performer may arrange to discuss request with patient's attending physician or appropriate specialist, such as vascular surgeon, cardiologist.

b. Performer considers alternative studies which could fill the need for additional information with less risk to the patient or with better results. Considers whether any alternative studies are preferable.

c. Performer may consider recommending a delay in the procedure while the patient's clinical status is improved, such as measures to bring blood pressure levels to normal, treatment of infection, nutritional inadequacy; may consider, with allergic patients, premedication with antihistamines or related drugs; may consider additional tests including sensitivity test to contrast medium. May order cessation of anticoagulant therapy.

d. Performer decides whether to approve request, delay scheduling and order prior procedures to strengthen patient, order additional or alternative tests, reorder earlier studies, or recommend no angiography, based on the information obtained and any discussion.

3. If performer recommends against a request, discusses with referring physician and writes reasons for refusal on requisition sheet, or destroys requisition if agreed to by referring physician.

If requested by physician, performer dictates a report on the decision,

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presenting his or her interpretation of any current radiographs, assessment of case, reason for refusal, and any other relevant comments. Returns materials on patient, and places dictated report to be picked up for typing.

4. If performer and physician agree on the requested or alternative studies, or if performer decides to postpone approval of the study, performer may decide to make recommendations on technique, depending on nature of study and patient's condition. May discuss with surgeon or specialist if appropriate.

   a. Performer may recommend the method of the vascular procedure, such as nonselective or selective catheterization, direct needle puncture, based on the purpose of the examination (anatomic delineation of vascular condition, dynamic function study, or organ opacification) and the condition of the patient. May recommend site of injection based on condition of vessels, likelihood of complications associated with various sites, and site of suspected pathology.
   b. Performer may recommend a particular iodine-based medium, size and type of needle, catheter (preshaped or not, radiopaque or not), guidewire, use of seriography, cine,spot filming, videotape, single or biplane radiography, hand or automatic injection, use of subtraction or magnification technique, use of compression, distension, physiological techniques or vasoactive drugs to affect flow of blood.
   c. Performer may consider the appropriate type of anesthesia, whether general or local; may discuss with anesthesiologist.
   d. Performer may order preliminary procedures or prior preparation of patient, or may discuss with attending physician and have this done. Such orders may include any or all of the following:

      i) Collection of relevant information such as lab test results, electrolyte level, ECG, vital signs, clotting time and prothrombin tests, result of allergy test to contrast medium.
      ii) Prior requirements for food and/or liquid intake, cleansing enema, and/or cathartic, and appropriate timing for these, based on the patient's age, the suspected pathology, and contraindications. May have female patient taken off oral contraceptive.
      iii) Prior administration of an intravenous infusion, sedation, or medication to reduce possible allergic reaction.
      iv) Special procedures to prevent infection or contamination of the patient or environment.
      v) If procedure is delayed, prior measures to improve the patient's strength and clinical status prior to the angiography procedure.

   e. Performer may consider whether a percutaneous route is possible or whether a "cut down" procedure such as Sones or Amplatz technique may be called for; considers dangers of technique. If decided on, may arrange to have this done by experienced radiologist or cardiologist.
   f. Performer may arrange to have patient contacted to sign a consent for the procedure. If patient is a juvenile or is not legally competent, performer may arrange to have proper person contacted so

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that a consent for the procedure can be signed. g. Performer writes orders and recommendations on technique, anesthetic, and preparation procedures for patient on patient's chart or requisition form explicitly so that physicians, nurses, technologists and other personnel can be scheduled for work. May specify need for cardiac monitoring team or equipment, need for surgeon if a "cut down" procedure may be called for. Gives information to appropriate secretary for scheduling. Signs requisition sheet if appropriate. h. Performer considers the urgency of the need and, if appropriate, expedites scheduling personally by discussing with appropriate staff person(s).	

TASK DESCRIPTION SHEET

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1. What is the output of this task? (Be sure this is broad enough to be repeatable.)

Pt. examined, reassured; decisions made on going ahead, method, technique, site of puncture, contrast medium, injection, serial filming; preparatory orders given; site anesthetized; artery punctured; needle placed or guide wire and catheter advanced under fluoroscopic control; injection and filming coordinated; arteriograms reviewed, and/or procedure continued until final approval; emergency care given; instruments removed; site compressed; orders for after care, tests, medical impressions recorded.

2. What is used in performing this task? (Note if only certain items must be used. If there is choice, include everything or the kinds of things chosen among.)

X-ray requisition form; pt.'s medical chart, prior films, scans; pen; view boxes; sterile tray with antiseptic, saline, anticoagulant, vasodilator, nerve block, swabs, tape, scissors, gauze, pressure dressings; local anesthetic, syringes, puncture needles, scalpels, guide wires, catheters; tourniquets; automatic injector; iodine-based contrast; table; film changer(s); fluoroscope, TV monitor; emergency cart; sterile gown, gloves drape; shielding

3. Is there a recipient, respondent or co-worker involved in the task? Yes...(x) No...( )

4. If "Yes" to q. 3: Name the kind of recipient, respondent or co-worker involved, with descriptions to indicate the relevant condition; include the kind with whom the performer is not allowed to deal if relevant to knowledge requirements or legal restrictions.

Any pt.; authorized adult; attending MD; radiologist; anesthesiologist; surgeon; radiologic technologist; nurse

5. Name the task so that the answers to questions 1-4 are reflected. Underline essential words.

Conducting peripheral arteriography of any pt. by percutaneous selective catheterization or direct needle puncture, by examining, reassuring pt., obtaining consent; deciding on method, technique, site, preparation; deciding whether to go ahead, pressure, timing for contrast injection, rate, speed for serial filming; injecting local anesthetic; making puncture and advancing needle or catheter and guide wire under fluoroscopic control; coordinating pressure injection of contrast and filming; evaluating; ordering, approving additional injections and arteriograms as appropriate; providing emergency care; removing instruments; ordering after care, tests; recording orders, medical impressions.

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Performer receives the x-ray requisition form and medical chart of a patient scheduled for peripheral arteriography (contrast study of the arterial vessels of the upper or lower extremities and/or supplying the bones and joints of the extremities) prior to the procedure, such as on the previous day or evening.

1. Performer reads the patient's medical history and requisition form to review the case or to become familiar with materials seen earlier in consultation in order to make decisions about the conduct of the radiographic study and to check on the request of the referring physician:
   a. Performer notes the patient's age, sex, weight, height, and nature and location of the suspected pathology or symptomology, such as vascular or bone lesions, evidence of vascular occlusive disease, soft tissue tumors, evidence of impaired circulation. Notes whether bilateral study is requested.
   b. Performer notes the purpose of the requested study such as for information for use in surgery, initial diagnosis, continuation of a sequence of angiographic studies (as when bilateral studies are separated in time), to evaluate progress of therapy. Notes name of referring clinician.

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Notes whether abdominal aorta and pelvic as well as peripheral arteries are to be visualized, whether area of interest includes hand(s) or feet.

c. Performer reviews the diagnostic information already obtained, including any prior radiographs, radioisotope scans, ultrasonograms, results of clinical tests, lab tests, ECG (EKG) and vital signs.

d. Performer notes relevant prior history such as prior incidents of vascular constriction, removal of any section of the vascular system, grafts and their sites, history of atherosclerosis, heart disease, renal, pulmonary, or liver disease, history of allergies or indications of allergy to iodine-based contrast media. If already done, notes results of allergy test, clotting time tests; notes stage of female patient's menstrual cycle, any possibility of pregnancy,whether on oral contraceptive. Notes whether patient has an infectious or communicable condition.

e. Notes whether prior orders have been given to improve patient's clinical condition; if so, notes progress.

f. Performer notes recommendations on method of examination (percutaneous needle or selective catheterization), site and route of entry, and use of equipment and materials. Notes recommendations on use of general or local anesthesia.

g. Checks to see whether patient or authorized adult has signed consent for procedure. If not, may decide to obtain personally before any sedation is given.

h. Performer may discuss case with referring clinician, specialist, or surgeon to obtain additional information. May arrange for attending physician, anesthesiologist and/or surgeon to accompany performer in examination of patient on day prior to the procedure.

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2. Performer visits patient and any authorized adult at bedside or in appropriate location. May be accompanied by clinician, anesthesiologist, surgeon, or appropriate specialist.

a. Performer greets patient and/or authorized adult and explains that a brief examination will occur. If any colleagues are with performer, performer introduces them. Reassures and answers questions.

b. Performer reads patient's chart. Notes any new clinical developments, response to care or medication. May ask patient or accompanying adult about symptoms and allergies. Examines the patient for relevant symptoms and general state. Reassures and answers questions. If not already done, performer determines whether there is any possibility of pregnancy in the case of a female patient.

c. Performer considers whether there have been changes in the patient's condition since the decision was made to do the procedure, and considers whether there are contraindications to going ahead with the procedure. May confer with specialist, clinician, or surgeon; discusses patient's current condition. Decides whether to proceed, cancel or delay procedure based on assessment of patient's current condition and any discussion.

d. If performer decides not to have procedure done, may discuss with

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clinician. Records reasons for cancellation and any recommendations such as for alternative procedure on patient's chart. Informs staff of cancellation and discusses with patient.

e. Performer may decide to delay procedure, have patient undergo treatment to improve clinical condition, such as treatment for blood pressure, infectious condition, or malnutrition. Discusses as appropriate and has orders given for care of patient. If patient has been on anticoagulant therapy, may order cessation until prothrombin and/or clotting times are within normal levels. May order cessation of oral contraceptive.

f. If performer decides to proceed, examines relevant arterial pulses to determine best vascular method and entry site(s):

  i) For lower extremity study, considers the femoral arterial pulsations; may examine left axillary arterial pulse. Notes presence or absence of abdominal, iliac, and foot pulses.
  ii) For upper extremity, examines femoral, subclavian, and/or axillary arteries. Considers direct needle puncture on side of interest or catheterization from opposite side.
  iii) Notes strength and expansive nature of the pulsations, presence of bruits (murmurs), presence of grafts, presence of ischemic symptoms, location of symptoms. Reviews recommendations.
  iv) Performer selects the method of entry (selective catheterization or direct needle puncture) and the vessel to enter depending on the condition of the pulses, location of pathology, areas of interest, clinical and surgical history, age, nature of symptoms and condition of vessels. Selects

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puncture site considering condition of area and convenience for the procedure. Avoids use of catheter and guide wires or direct puncture where there is severe atherosclerotic involvement.
  v) Performer examines and records condition of the extremities, presence and character of pulses at, and distal to, the artery to be punctured.

g. Performer decides on the type of equipment to use based on institutional facilities and nature of study:

  i) May order use of large film angiographic serial changer, unit with push rod and wedge filter, single or biplane unit, fluoroscopic capabilities for monitoring, depending on the area of interest and nature of pathology.
  ii) If selective catheterization is ordered, may indicate type of catheter, whether preshaped, with side holes, whether radiopaque. For direct needle puncture, orders size and type based on nature of the study, area(s) of interest and patient's size and condition.

h. If performer decides to proceed and a consent for the procedure has not been obtained, performer may explain to the patient or guardian in comprehensible language what will occur in the procedure, its purpose, and the dangers to the patient involved. Performer explains the alternatives; answers questions before any sedation is given.

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i) When the performer is sure that the patient understands the risks, asks the patient for signature on consent form and checks that it is properly signed.

ii) If a guardian is to sign, performer explains to the individual as appropriate.

iii) If a consent is not agreed to, performer postpones procedure until it is obtained. May discuss with appropriate physician or individuals and/or with patient. Does not proceed unless consent is obtained.

i. When a consent is obtained performer makes preliminary decisions on care of patient:

i) Decides on use of general and/or local anesthetic. May discuss with anesthesiologist. If a general anesthetic is to be administered, performer arranges to have staff ready at the appropriate time.

ii) Decides whether the procedure should be scheduled for more than one session (unless the one currently to be scheduled is a continuation).

iii) Performer makes final decisions on prior preparation of the patient such as sedation, period for withholding of food and/or drink, or hydration as appropriate; use of prior IV drip,cleansing enema; shaving of entry site (s); prior administration of antihistamine,medications to deal with problems of blood clotting.

iv) May order medication or physical means to accelerate arterial flow for use during procedure.

v) Performer records as appropriate so that patient can be prepared

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and staff assigned. May sign requisition; places for scheduling.

j. Performer records orders for equipment such as types and sizes of needles, catheters, guide wires, contrast solution, use of seriography, injection equipment.

k. Reviews with patient the procedures that will occur.

3. Just prior to the time for which the procedure is scheduled, the performer reviews all the relevant medical information and the patient's chart. Reviews relevant prior radiographs. Notes any new developments.

a. Performer greets patient in examination room. May question about symptoms; reassures and explains what will occur.

b. Performer checks that all prior preparatory procedures have been carried out.

i) Checks report on electrolyte levels, blood clotting time, vital signs.

ii) Checks that any orders for hydration, starting of IV infusion, prior administration of medication or sedation have been carried out, and at appropriate time. If not, arranges to have these done and/or procedure delayed.

c. Performer considers whether patient's current condition presents any contraindications to going ahead with the procedure. May have clinician or specialist called; discusses patient's condition and any alternative steps. Decides whether to proceed or not based on evaluation of patient's condition and contraindications.

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d. If performer decides not to proceed, records reasons and any recommendations on patient's chart. Informs appropriate co-worker of cancellation and has patient returned to room. If appropriate, orders rescheduling of patient or scheduling for alternative procedure.

e. Performer examines puncture site(s) to review earlier decisions. Makes sure no swelling or tenderness is present. Considers alternative puncture site(s) if appropriate.

f. If patient is pediatric patient or if general anesthesia has been suggested for adult, performer may reconsider whether general anesthesia is still warranted; may decide to order if patient's behavior and condition suggest the need. If general anesthesia is to be carried out, performer discusses with anesthesiologist when it is to be administered and plans to coordinate with anesthesiologist.

g. May order sedation and/or IV drip if appropriate and not already administered. Has puncture site and possible alternative sites shaved and prepared.

h. Performer may explain or demonstrate use of equipment to a child to allay fears and enlist cooperation; answers questions. Explains that patient will be asked to hold still from time to time. Indicates what will happen, what pain might be experienced, and what cooperation will be needed. Stresses need to maintain positions when ordered.

4. Performer makes final decisions on technique and surgical procedures:

a. Decides on or checks sizes of needles, catheters, guide wires. Decides on type and amount of contrast material, use of automatic

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injection, use of biplane or single plane serial changer.

b. Performer decides whether to instill medium fractionally.

c. If a biplane study is involved, orders AP and lateral projections or indicates desired angulation. Indicates whether biplane films will be taken simultaneously or sequentially.

d. Performer decides on program for seriography, and proper elapse of time to provide venograms if appropriate. Informs technologist of the number of films to be taken, the per-second intervals, and the number of series anticipated. Has equipment checked.

e. Has technical factors set for fluoroscopy.

f. Performer orders scout film(s) as appropriate for single or biplane views. Makes sure proper shielding is being used.

   i) Performer places the processed scout films on view boxes and examines as soon as they are ready. Performer considers whether the areas of interest are visible, whether the technique is satisfactory, and whether the position(s) of the patient are correct.
   ii) If the scouts are not satisfactory, performer indicates the needed changes in technique or in the patient's position to the radiologic [illegible]ogist.

g. If general anesthesia i[illegible] administered, indicates t[illegible]thesiologist when procedure [illegible] to start and allows for appropriate timing.

h. Informs appropriate co-workers of decisions so that patient and materials can be prepared.

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5. Performer returns to patient in procedure room when informed that patient and equipment are ready:
   a. Checks whether patient has been properly shielded, immobilized and prepared for sterile puncture procedure. If not acceptable, indicates the needed adjustments. May decide to immobilize personally.
   b. Checks sterile tray prepared for procedure. Requests any missing objects.
      i) Performer checks that appropriate needle and catheter sizes are available and catheters preformed if appropriate. Checks guide wires. May bend catheter personally.
      ii) Performer may prepare or check percutaneous needle to be used.
      iii) Checks that syringes with saline and anticoagulant solution are prepared, that syringes with contrast medium are ready.
      iv) Checks appearance of contrast medium to be sure there is no chemical deterioration; checks amount.
      v) May prepare syringe with local anesthetic or checks.
   c. If patient has special equipment such as IV or indwelling catheter, performer makes sure that these are being monitored. May check that ECG monitoring equipment is present. Checks that emergency cart is present.
   d. Checks that seriography equipment is ready for use, that technical factors are set for seriography and fluoroscopy, and that equipment for pressure injection is checked and ready for use.
   e. Dons protective lead garments and sterile gown and gloves when appropriate. Checks staff shielding.

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   f. If patient is coherent, performer explains what will be done. Answers patient's questions as appropriate. Reassures patient and does so as deemed needed throughout procedure.
   g. If general anesthesia is to be administered, checks with anesthesiologist to be sure that the patient is ready for procedure to begin.

6. Performer proceeds to prepare the puncture site(s) using sterile technique:
   a. Has patient positioned appropriately for the puncture site chosen so as to provide access.
      i) For puncture of femoral artery positions patient for access below the inguinal ligament as high as possible, but allowing for later compression of the vessel proximal to the puncture site.
      ii) For subclavian puncture has patient lie with head slightly extended and turned away from puncture site, providing access to root of neck or below clavicle.
      iii) For axillary puncture has patient lie supine with arm abducted and elbow bent, providing access to area below clavicle or in the axilla.
      iv) Performer locates the vessel for puncture visually and/or by feeling for arterial pulsation in the location selected. May choose more palpable position in vessel allowing for later compression.
   b. Prepares the site for injection of the local anesthetic and puncture by swabbing with prepared anti-

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septic solution. Covers surrounding areas with sterile drapes, leaving only small area for injection and puncture uncovered.

   c. Checks amount of local anesthetic to be injected as shown by nurse in syringe,or draws anesthetic into sterile syringe. Checks no air is present;inserts needle intradermally and subcutaneously; injects. Makes sure to infiltrate the skin and the sheath of the artery on both sides of the vessel. Removes needle. Waits for area to become anesthetized.
   d. If performer has decided to use reactive hyperemia (increase of arterial flow rate) by use of ischemia (constriction), or infusion or injection of a vasoactive drug, performer times the application of the technique so that the contrast material will be injected during the period of maximal increased flow.

      i) Performer may apply tourniquet(s) and inflate proximal to the arterial pressure for several minutes before the injection. For transfemoral route may apply tourniquet only on side opposite the side to be injected.
      ii) Performer may have an intraarterial infusion of a vasodilator prepared or may prepare to inject a block into the sympathetic fibers around the artery.

7. If selective "Seldinger" catheterization is to be done, performer proceeds as follows:

   a. If patient is conscious, explains when patient is to hold steady for puncture.
   b. Performer feels for the appropriate arterial pulse by palpating with fingers. Makes an incision or nick

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through the skin with a sterile scalpel at the site where the needle and catheter will enter.

   c. Performer inserts puncture needle tip (appropriately sized hollow needle with sharp cutting inner stylus) into incision while palpating and fixing the artery. Performer angles needle to enter along the lateral side of the vessel with the tip directed towards the vessel of interest to be catheterized. May attempt to enter only the anterior wall.
   d. Performer pulls out the needle's inner stylus and withdraws the needle slowly until a characteristic "pop" is felt and a vigorous jet of arterial blood is obtained.

      i) May advance needle into the artery in the direction of the route to be catheterized.
      ii) May pull back on needle, reinsert, or make other incisions until artery is successfully entered.

   e. Performer inserts the selected safety guide wire into the needle and advances this into the vessel in the direction of the planned route for catheterization.
   f. Once the guide wire is inserted, performer withdraws the hollow needle, compressing the artery to reduce the bleeding. Cleans blood off guide wire. Inserts the appropriate size catheter by threading catheter over the guide wire and into the artery.
   g. Performer decides whether to advance the catheter using the guide wire as a leader or to remove guide wire. If so decided, removes guide wire. May advance guide wire before removing needle and introducing catheter.

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h. Performer may check position of catheter at this point. If so, positions the overhead fluoroscope unit over the patient; may have lights in room dimmed; activates the fluoroscope; adjusts technical factors or has this done. Adjusts position of guide wire and/or catheter to be sure that the catheter is free to pass along the lumen of the vessel.

i. Performer advances the catheter (with or without guide wire as a leader) under fluoroscopic control as appropriate to planned injection site:

  i) In advancing the catheter and/or guide wire, performer is careful not to force passage.
  ii) If an obstacle is encountered, performer checks position using fluoroscopy, syringe and small amount of contrast solution (as described below). Injects a small amount of contrast into the artery through the catheter, activates fluoroscope, and views on the TV monitor. Determines problem and redirects guide wire or catheter as appropriate.
  iii) If performer judges that entry through site chosen cannot be properly accomplished, performer may decide to enter from an alternative route, from the opposite side artery, or by direct needle puncture. Performer repeats appropriate steps for new location after properly caring for initial site.
  iv) For lower extremity femoral route (transfemoral or bilateral) performer advances guide wire and/or catheter to the aortic bifurcation. Checks by using fluoroscopic control. Then positions catheter in abdominal aorta with

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tip at about the level of the twelfth thoracic intervertebral space.
  v) If femoral catheterization of the side of interest is required, performer positions catheter tip in the external iliac artery.
  vi) For upper extremity femoral route performer advances guide wire and/or catheter from femoral artery into aorta and then into subclavian artery (left or right), axillary or brachial artery. Uses preshaped guide wire or catheter for right subclavian artery. For bilateral view may place catheter tip in ascending aorta.
  vii) For upper extremity axillary route, performer advances guide wire and/or catheter retrogradely along axillary artery opposite side of interest, into subclavian artery, aortic arch, to desired point in the subclavian or axillary artery on the side of interest.
  viii) For arteriography of bones and joints or localized lesions, performer directs catheter into the feeder vessel supplying the area of interest.

j. Performer has syringe prepared with saline and/or an anticoagulant. Flushes catheter periodically to avoid clotting and to keep catheter clear.

8. If direct percutaneous needle puncture is to be done, performer proceeds as follows:

a. Performer feels for the appropriate arterial pulse by palpating with fingers. May make an incision or nick through the skin with a sterile scalpel at the site where the needle will enter.

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b. If patient is conscious, explains when patient is to hold steady for puncture.

c. Performer inserts a two-part needle or a teflon needle equipped with stylet and teflon sheath into the incision while palpating and fixing the artery. Performer angles needle to enter along the lateral side of the vessel with the tip directed along the course of the artery. May attempt to enter only the anterior arterial wall.

d. Performer pulls out the solid inner part of the hollow needle or stylet of teflon needle slowly until a characteristic "pop" is felt and a vigorous jet of arterial blood is obtained. May advance needle into the artery in the direction of the arterial flow. May pull back on needle, reinsert, or make other incisions until artery is successfully entered.

e. Performer may insert a guide wire into needle several inches into the vessel and advance the needle over this to lodge it firmly in the lumen of the vessel. Removes guide wire and wipes off blood. When not in use, reinserts stylus in needle. Performer may secure needle with tape.

f. With teflon needle performer removes stiff inner needle after checking correct placement (as described below in step 9) leaving teflon sheath in place. May advance sheath several inches inte lumen of vessel.

g. Performer may attach syringe prepared with saline and/or anticoagulant to needle (via tubing attached to needle or teflon sheath). Flushes periodically to avoid clotting.

9. Performer may use overhead filming or fluoroscopy to check placement of catheter or needle. Performer has a syringe prepared with a small amount of the contrast solution. Checks that medium is appropriate. Connects syringe to the needle, or to the catheter.

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a. With two-part or teflon needle, performer may position overhead x-ray tube to take view that will show depth of entry into artery.

b. With catheter, positions fluoroscope unit over patient and activates.

c. Performer has patient hold still. Injects a small amount of the solution into the artery for viewing location of needle or catheter.

d. For needle, has technologist take radiograph. Performer views radiograph on view box when it is brought or goes to automatic processor. Evaluates and decides whether needle is at correct depth and "lie" in lumen or needs to be readjusted. Repeats insertion and radiography until this is accomplished.

e. For catheter, locates site of entry of catheter and checks position of catheter within vessel by viewing on TV monitor. Performer judges whether catheter is correctly inserted in lumen of vessel rather than in an intramural or extravascular position by viewing on TV monitor and watching flow of test dose. Readjusts or reinserts catheter, checking on fluoroscope monitor until this is accomplished. May use guide wire as leader.

f. If performer judges that entry through site chosen cannot be properly accomplished, performer may decide to enter from the opposite artery or alternative route if appropriate. If so, performer repeats appropriate steps for new

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location after caring for initial site.

g. If entry or placement cannot be easily accomplished, performer may decide to terminate so as to avoid further trauma to vessels. If so, performer records as appropriate and informs staff. May arrange for rescheduling.

h. Performer reattaches syringe with saline and anticoagulant to needle or catheter and flushes entry site periodically.

10. Performer prepares for immediate injection of contrast and filming:

    a. Depending on the type of reactive hyperemia selected, performer may infuse a vasodilator, inject a block into sympathetic fibers around artery, or alert staff to remove tourniquet(s) on signal.
    b. Has patient positioned as appropriate for AP projection or AP and lateral biplane study. For femoral lower extremity study may order successive positioning for abdominal aorta, pelvic, thigh and distal runoff vessels unless large size films are being used. Has patient lie in supine position with feet together and toes pointing up. May have feet everted.
    c. Indicates whether more than one injection is anticipated, and sequence of programs for radiography of separate areas.
    d. Makes sure proper (close) collimation will be observed and appropriate shielding is in place.
    e. Performer checks that materials are ready for pressure injection of the contrast solution and for serial filming. Checks that patient is properly immobilized, shielded and positioned. Checks coordination of injection with filming:

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i) Checks that the automatic injector (used for introduction of the contrast solution under pressure) is loaded with proper minimum amount of medium in syringe; checks that syringe is attached to injector tubing. Attaches tubing to catheter, needle, or teflon sheath. Checks that there is no air in system.

ii) Performer checks on or orders the rate and pressure setting for the entry force for the automatic injector. Considers the pressure needed to inject the contrast medium into the vessel of interest given the technique, vessel, and other conditions involved.

iii) Performer has overhead x-ray tube(s) (single or biplane) positioned for serial filming; checks with the technologist the rate of speed and length of time selected. Checks rate in relation to the series of injections of the contrast solution and any need for filming of venous return.

iv) Has any tourniquets removed when appropriate.

11. Performer directs injection and filming:

    a. Performer may enter control room. Has patient hold steady if conscious or awaits indication from anesthesiologist that respiration has been suspended.
    b. Performer tells technologist when to start the automatic film changer(s) (to make sure of proper functioning) to take the series of pre-programmed radiographs. Once changer has started, performer activates the automatic injector.

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c. Performer may decide to view serial films for the first projection(s) ordered before continuing with other views. If injecting and filming continuously, performer repeats appropriate steps for additional views and patient positions. Arranges to see arteriograms as appropriate.

12. While serial films are being processed, performer examines and talks to patient (if conscious) to evaluate how the patient has responded to the procedure and the injection.

    a. Detaches injector tubing; reflushes catheter or needle.
    b. If ECG is being monitored, evaluates any changes during initial injection as possible contraindication for additional injections.
    c. May decide to provide emergency care at any time throughout procedure if patient shows signs of adverse reactions.

13. Performer looks at the first set of serial arteriograms on view boxes in sequence as soon as they are processed. Places posterior and lateral views together.

    a. Checks for technical quality and notes whether any irregularities are due to artifacts or actual pathological or abnormal conditions, and whether the views are clear enough for medical interpretation. Performer may ask opinion of another radiologist.
    b. Determines whether the arteriograms adequately demonstrate the vessels and structures being studied and provide sufficient information about any pathology, blockage, or distortion of the flow, the extent and location of any arteriovenus malformation, the presence of aneurysms, and other signs of abnormal structure or pathology.

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    c. Performer considers whether to inject additional contrast and continue serial filming, repeat injection and filming with change in technical factors or patient position. Considers additional or alternative approaches such as direct needle puncture, additional locations such as bilateral study, or placement of catheter or needles in distal vessels.

        i) Considers the patient's condition, the contraindications, the information already supplied and urgency. May discuss with anesthesiologist and/or clinician.
        ii) If additional arteries are to be opacified, or if the other side is to be opacified, performer may decide that the other side or additional arteries are to be examined at a second session after several days.

    d. If performer is to catheterize a series of arteries at this time, performer reintroduces the guide wire into the catheter. Under fluoroscopic control, the performer sequentially withdraws and reinserts the catheter as appropriate to reach the arteries of interest.
    e. For pelvic and more distal vessels of the lower extremities performer may pull catheter down so that tip is approximately above the aortic bifurcation.
    f. For additional puncture sites and bilateral catheterization repeats appropriate steps as described above.
    g. For additional injections, change of position, change in technical

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factors, performer reviews decisions on injection pressure, amount of contrast, rate and speed of serial programs; indicates what is needed to staff and repeats as appropriate. Allows appropriate elapse of time between injections for patient to respond optimally.

h. Repeats relevant steps for repeat or additional views and locations as described above.
Repeats review of radiographs as described above until satisfied that the angiograms are technically adequate to demonstrate the areas and conditions under study and to provide sufficient information to make possible a competent medical interpretation.

14. Throughout procedure performer evaluates how the patient is responding. May decide to provide emergency care:

a. Performer determines the severity of the condition by listening for heartbeat, respiration; may check blood pressure; may take EKG reading, using equipment on emergency cart.

b. If patient has a severe reaction to the procedure or contrast medium, such as cardiac arrest, anaphylactic shock (exaggerated negative reaction to the foreign substance), bronchospasm or laryngospasm (stricture of bronchial tubes or larynx), hypotension (drop in blood pressure), cyanosis (bluish discoloration due to excessive concentration of reduced hemoglobin in blood), urticaria (vascular skin reaction), or violent sneezing, performer proceeds at once with emergency life support or measures to control the reaction.

i) May have anesthesiologist or life support team called at once.

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ii) May administer oxygen or air using oxygen tank and mask or ambu bag; may clear airway using finger or tongue blade.
iii) May decide to establish an airway by removing any dentures and, using a laryngoscope (to view larynx) insert an endotracheal tube.
iv) May apply closed chest cardiac massage.
v) Depending on ECG results may apply defibrillator by selecting watt seconds, applying, and raising watt seconds until effective.
vi) Depending on ECG results may administer a prepared intracardial injection of a heart stimulant.
vii) May administer IV infusion; may order and administer a corticosteroid, an antihistamine or atropine.
viii) May administer Valium in solution through the injection catheter.

c. Performer decides whether the reaction is sufficiently controlled to proceed.

i) If performer decides to terminate procedure, notifies appropriate medical staff; orders aftercare as appropriate; has patient transported to appropriate location.
ii) Records patient's reactions and what was done on patient's chart. If appropriate, makes sure patient is informed of the type of drug that caused the reaction or explains to patient that he or she is allergic to the contrast solution (i.e. iodine-based solution).

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d. If performer judges that patient displays a strong (but not emergency) allergic reaction:

   i) Performer may order and administer a corticosteroid, an antihistamine or atropine.
   ii) Records reaction and what was done. Explains if appropriate to patient that he or she is allergic to the contrast solution (i.e. iodine-based solution).

15. Performer decides when the radiographic examination is completed based on information on the arteriograms and the patient's condition. Informs anesthesiologist (if present), technologist and other staff that procedure is to be terminated.

   a. Performer returns to the patient. If patient is conscious, performer reassures patient and explains what will happen next.
   b. Removes any connecting tubes or syringes from catheter(s), teflon sheath(s) or needle(s).
   c. Performer gently and slowly withdraws the needle(s) or catheter(s). Manipulates any catheter by turning and pulling gently, taking care not to injure the vessel or enlarge the wound at the entry point.
   d. Performer compresses the vessel proximal to or at the puncture site with the fingertips and/or sterile gauze for an appropriate amount of time.

      i) Does not totally occlude the artery. Checks that there is a pulsation distal to the puncture site and no hematoma at the site.
      ii) May have a staff member continue the compression for the time needed. Makes changeover so as to maintain pressure by withdrawing own hands from under those of the relieving staff member once they are in place.

   e. Performer applies or orders pressure dressing to be kept in place appropriate amount of time.
   f. Performer may order fluids to be given intravenously or by mouth. May order bed rest for appropriate period while patient recovers from effects of procedure.
   g. Arranges to have puncture holes examined in follow up check. Informs patient or attending staff to report further oozing of blood or swelling.
   h. Performer may order careful observation of patient including vital signs, urinary output, and skin care. May order tests, fill out order forms. May order medication.
   i. Has appropriate sanitary clean up procedures carried out.
   j. If requested, calls surgeon or clinician and reports preliminary results and findings.

16. Performer records impressions of procedure on patient's chart:

   a. Preliminary findings.
   b. How patient tolerated procedure.
   c. Any special nursing follow-up recommended, tests ordered, records and observation required, medication, later studies ordered.
   d. May sign chart, requisition sheet or order forms.

TASK DESCRIPTION SHEET

Task Code No. 471

This is page 1 of 10 for this task.

1. What is the output of this task? (Be sure this is broad enough to be repeatable.)

Pt. examined,reassured;decisions made on going ahead, preparation,method,site,contrast,equipment,serial program and injection pressure,rate;site anesthetized;vein punctured;compression,exercise and/or straining applied as appropriate;injections and filming coordinated for first and/or second stage;venograms reviewed,approved;emergency care given;instruments removed;orders for after care,tests,medical impressions recorded.

2. What is used in performing this task? (Note if only certain items must be used. If there is choice, include everything or the kinds of things chosen among.)

X-ray requisition form;pt.'s medical chart,prior radiographs,scans;pen;view boxes;sterile tray with antiseptic,saline,anticoagulant,swabs,tape,scissors, gauze,pressure dressings,bandage,local anesthetic, syringes,puncture needles,scalpels,tourniquet; weights;automatic injector;iodine-based aqueous contrast;tilt table;serial film changer(s);fluoroscope, TV monitor;lead garments;emergency cart;sterile gown, gloves,drape;shielding

3. Is there a recipient, respondent or co-worker involved in the task? Yes...(X) No...( )

4. If "Yes" to q. 3: Name the kind of recipient, respondent or co-worker involved, with descriptions to indicate the relevant condition; include the kind with whom the performer is not allowed to deal if relevant to knowledge requirements or legal restrictions.

Any pt.;authorized adult;attending MD;radiologist; surgeon;radiologic technologist;nursing personnel

5. Name the task so that the answers to questions 1-4 are reflected. Underline essential words.

Conducting ascending or descending venography of lower extremities of any pt. by direct needle puncture by examining, reassuring pt.;deciding on whether to go ahead,method,site;obtaining consent;deciding on materials,contrast,type of injection,filming program;injecting anesthetic;inserting puncture needle;applying compression,weights,exercise,straining by pt. as appropriate;injecting contrast;ordering serial films;evaluating venograms;continuing as decided;providing emergency care;removing instruments;ordering care,tests;recording orders,medical impressions.

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Performer receives the x-ray requisition form and medical chart of a patient scheduled for venography of the lower extremities (contrast study of the veins of the legs after percutaneous needle injection) prior to the procedure, such as on the previous day or evening or on the same day.

1. Performer reads the patient's medical history and requisition form to review the case or to become familiar with materials seen earlier in consultation in order to make decisions about the conduct of the radiographic study and to check on the request of the referring physician:
   a. Performer notes the patient's age, sex, weight, height, and the nature and location of the suspected pathology or symptomology, such as vascular lesions, evidence of vascular occlusive disease, soft tissue tumors, evidence of impaired circulation. Notes whether bilateral study is requested.
   b. Performer notes the purpose of the requested study, such as for information for use in surgery, initial diagnosis. Notes name of referring physician.
   c. Performer reviews the diagnostic information already obtained, including any prior radiographs, radio-

OK-RP;RR;RR

6. Check here if this is a master sheet..(X)

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isotope scans, ultrasonograms, results of clinical tests, lab tests, EKG (ECG) and vital signs.

d. Performer notes relevant prior history such as prior incidents of vascular constriction, removal of any section of the vascular system, grafts and their sites, history of heart disease, renal, pulmonary, or liver disease, history of allergies or indications of allergy to iodine-based contrast media. If already done, notes results of allergy test, clotting time tests; notes stage of female patient's menstrual cycle, any possibility of pregnancy,whether on oral contraceptive. Notes if patient has infectious or communicable condition.

e. Notes whether prior orders have been given to improve patient's clinical condition; if so, notes progress.

f. Performer notes recommendations on method of examination (ascending or descending venography), site of entry, use of equipment and materials, areas of the venous system to be visualized. Notes recommendations on use of local anesthesia.

g. Checks to see whether patient or authorized adult has signed consent for procedure. If not, may decide to obtain personally before sedation.

h. Performer may discuss case with referring clinician, specialist, or surgeon to obtain additional information. May arrange for attending physician, and/or surgeon to accompany performer in examination of patient.

2. Performer visits patient and any authorized adult at bedside, and/or in appropriate location just prior to the time for which the procedure is scheduled. The performer reviews all the relevant medical information and the patient's chart. Reviews relevant prior radiographs. Notes any new developments. May be accompanied by clinician, surgeon, or appropriate specialist.

a. Performer greets patient and/or authorized adult and explains that a brief examination will occur. If any colleagues are with performer, performer introduces them. May question about symptoms; reassures and explains what will occur.

b. Performer reads patient's chart. Notes any new clinical developments, response to care or medication. Checks report on electrolyte levels, blood clotting time, vital signs. May ask patient or accompanying adult about symptoms and allergies. Examines the patient for relevant symptoms and general state. Reassures and answers questions. If not already done, performer determines whether there is any possibility of pregnancy in the case of a female patient, whether on oral contraceptive.

c. Performer considers whether there have been changes in the patient's condition since the decision was made to do the procedure, and considers whether there are contraindications to going ahead with the procedure. May confer with specialist, clinician, or surgeon; discusses patient's current condition. Decides whether to proceed, cancel, or delay procedure based on assessment of patient's current condition, contraindications and any discussion.

d. If performer decides not to proceed, may discuss with clinician. Records reasons for cancellation and any recommendations on patient's chart. Informs staff of cancellation and discusses with

TASK DESCRIPTION SHEET (continued)

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patient. If appropriate, orders rescheduling of patient or scheduling for alternative procedure.

e. Performer may decide to delay procedure, have patient undergo treatment to improve clinical condition, such as treatment for blood pressure, infectious condition, or malnutrition. Discusses as appropriate, and has orders given for care of patient. If patient has been on anticoagulant therapy, may order cessation of therapy until prothrombin and/or clotting times are within normal levels. May order no oral contraception for several days. After delay proceeds as described above.

f. If performer decides to proceed, examines relevant structures to determine best vascular method and entry site(s):

   i) Performer selects ascending venography to demonstrate the deep and superficial venous systems; for selective distribution of contrast performer plans to use a tourniquet to demonstrate the deep crural veins and perforating veins; plans to use exercise to demonstrate the muscle veins. Performer may select descending venography to demonstrate the femoral vein, the distal veins (with straining) and the external and common iliac veins (without straining).

   ii) If ascending venography is being considered, performer examines veins in foot such as the dorsal vein; if descending venography is being considered, examines proximal vein such as femoral.

   iii) Performer examines puncture site(s). Makes sure no swelling or tenderness is present. Notes presence of scars, ischemic symptoms, location of symptoms.

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Considers alternative method and/or puncture site(s) if appropriate.

g. Performer decides on the type of equipment to use based on institutional facilities and nature of study:

   i) May order use of large film angiographic serial changer, unit with push rod and wedge filter, single or biplane unit, fluoroscopic capabilities for monitoring, depending on the areas of interest and nature of pathology.

   ii) Orders size and type of needle for puncture based on nature of study, area(s) of interest and patient's size and condition.

   iii) Decides on type and amount of contrast material, hand or automatic pressure injection.

   iv) If a biplane study is involved, orders AP and lateral projections or indicates desired angulation. Indicates whether biplane films will be taken simultaneously or sequentially.

   v) Performer decides on program for seriography, and proper elapse of time to provide venograms if appropriate. Informs technologist of the number of films to be taken, the per-second intervals, and the number of series anticipated. Has equipment checked.

   vi) Has technical factors set for fluoroscopy.

h. If performer decides to proceed and a consent for the procedure has not been obtained, performer may explain to the patient or guardian in comprehensible language what will occur in the procedure, its purpose, and the dan-

List Elements Fully	List Elements Fully
gers to the patient involved. Performer explains the alternatives; answers questions. i) When the performer is sure that the patient understands the risks, asks the patient for signature on consent form and checks that it is properly signed. ii) If a guardian is to sign, performer explains to the individual as appropriate. iii) If a consent is not agreed to, performer postpones procedure until it is obtained. May discuss with appropriate physician or individuals and/or with patient. Does not proceed unless consent is obtained. i. Performer orders or checks on prior preparation of patient: i) Decides on local anesthetic. May discuss. ii) Performer may order or check on administration of prior tranquilizer or sedation, period for withholding of food and/or drink, or hydration, as appropriate; use of prior IV drip, cleansing enema; prior administration of antihistamine, medications to deal with problems of blood clotting. iii) May order medication or physical means to accelerate venous flow for use during procedure. iv) Performer records as appropriate so that patient can be prepared and staff assigned. May sign requisition; places for scheduling. v) If procedure is about to begin and any preparatory steps have not been carried out, arranges to have done and/or procedure delayed as appropriate. j. Performer may explain or demonstrate use of equipment to a child	to allay fears and enlist cooperation; answers questions. Explains that patient will be asked to hold still from time to time. Indicates what will happen, what pain might be experienced, and what cooperation will be needed. Stresses need to maintain positions when ordered. If exercise or Valsalva maneuver will be used, may rehearse patient. Explains how to take a deep breath, hold breath in, and bear down as though evacuating, until told to relax. k. Informs appropriate co-workers of decisions so that patient and materials can be prepared. Has puncture site and possible alternative sites shaved and prepared. l. Performer orders scout film(s) as appropriate for single or biplane views. Makes sure proper shielding is being used. Orders vertical views for ascending venography and supine views for descending venography. i) Performer places the processed scout films on view boxes and examines as soon as they are ready. Performer considers whether the areas of interest are visible, whether the technique is satisfactory, and whether the position(s) of the patient are correct. ii) If the scouts are not satisfactory, performer indicates the needed changes in technique or in the patient's position to the radiologic technologist. 3. Performer returns to patient in procedure room when informed that patient and equipment are ready:

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a. Checks whether patient has been properly shielded, immobilized and prepared for sterile puncture procedure. If not acceptable, indicates the needed adjustments. May decide to immobilize personally.

b. Checks sterile tray prepared for procedure. Requests any missing objects.

   i) Performer checks that appropriate needle sizes are available. May prepare or check percutaneous needle to be used.

   ii) Checks that syringes with saline and anticoagulant solution are prepared, that syringes with contrast medium are ready.

   iii) Checks appearance of contrast medium to be sure there is no chemical deterioration; checks amount.

   iv) May prepare syringe with local anesthetic or checks.

c. If patient has special equipment such as IV or indwelling catheter, performer makes sure that these are being monitored. Checks that emergency cart is present.

d. Checks that seriography equipment is ready for use, that technical factors are set for seriography and fluoroscopy, and that equipment for hand or automatic pressure injection is checked and ready for use.

e. Dons protective lead garments and sterile gown and gloves when appropriate. Checks staff shielding.

f. If patient is coherent, performer explains what will be done. Answers patient's questions as appropriate. Reassures patient and does so as deemed needed throughout procedure.

4. Performer prepares the puncture site(s) using sterile technique:

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a. Has patient positioned appropriately for the injection site chosen so as to provide access.

   i) For ascending venography performer has patient prepared for puncture in a foot vein such as the dorsal vein of the great toe. Applies a tourniquet around the ankle above the malleoli if the deep crural veins are to be visualized. May have patient seated on stool with foot on table so that lower leg is vertical and foot is at level reachable by performer for puncture procedure.

   ii) For descending venography has patient placed in supine position with access to the femoral vein at the level of the oval fossa of the thigh.

   iii) Performer locates the vessel for puncture visually and/or (with femoral vein) by finding the proximal pulse of the femoral artery and palpating a point just medial at 5 to 8 cm. below Poupart's ligament.

b. Prepares the site for injection of the local anesthetic and puncture by swabbing with prepared antiseptic solution. Covers surrounding areas with sterile drapes, leaving only small area for injection and puncture uncovered.

c. Checks amount of local anesthetic to be injected as shown by nurse in syringe or draws anesthetic into sterile syringe. Checks no air is present; and inserts needle intradermally and subcutaneously; injects. Removes needle. Waits for area to become anesthetized.

d. If performer has decided to use straining or exercise, performer

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plans the injection and the filming so that visualization will take place at the proper phase of circulation.

5. When the entry area has become anesthetized performer makes sure that the entry site is optimally distended and prepares for puncture:
   a. Chooses appropriate puncture needle as selected with polyetheline tubing attached. Performer may use a scalpel to make a small incision at the entry site(to facilitate entry of needle).
   b. Performer has patient hold still. Performer attempts to penetrate the vein (at the incision if created), while palpating and fixing vein. Performer inserts needle in the direction of flow.
   c. Performer pulls out the needle's inner stylus; attaches vena tube to needle;suctions back and checks needle entry by noting whether venous blood appears. May pull back on needle and reinsert or make other insertions until the needle tip is judged within the lumen of the vein. Removes vena tube. May attach syringe with saline and/or anticoagulant to tubing of needle and flush entry site periodically.

6. Performer may use radiography or fluoroscopy to check needle placement and evaluate amount of contrast to inject:
   a. Has tubing attached to needle cut near proximal end of needle.
   b. Performer connects syringe prepared with contrast solution to the tubing of the needle.
   c. Positions overhead x-ray tube or fluoroscope unit over patient to visualize needle within the vein.

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Has patient hold still. Injects a small test dose of the contrast solution into the vein and activates fluoroscope or has technologist make overhead exposure.

i) With fluoroscopy, observes the flow of the contrast on the TV monitor. Performer adjusts needle position if required while viewing on TV monitor. While noting the flow of the test dose performer decides on the appropriate amount of contrast to inject and the speed and force to use for the injection. May flush entry site.

ii) With radiography, performer views radiograph on view box when it is brought or goes to automatic developer. Evaluates and decides whether needle is at correct depth and "lie" in lumen or needs to be readjusted. Repeats insertion and radiography until this is accomplished.

   d. Performer may insert a guide wire into needle several inches into the vessel and advance the needle over this to lodge it firmly in the lumen of the vessel. Removes guide wire and wipes off blood. Performer may secure needle with tape and flush periodically with saline solution.
   e. If teflon needle is used performer removes stiff inner needle after checking correct placement, leaving teflon sheath in place. May advance sheath several inches into lumen of vessel. May flush entry site.

7. Performer prepares for the first stage serial filming:

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a. For ascending venography has patient seated so that sole of foot is resting flat and lower leg is vertical.
    i) Maintains tourniquet in place to demonstrate deep crural veins. Does not use tourniquet if superficial veins are to be demonstrated.
    ii) Has bucky and/or vertical grid single plane or biplane serial cassette changer(s) positioned to take frontal and lateral views of the erect lower leg.

b. For descending venography has patient remain supine and repeats instructions to patient to strain when so ordered. Has serial cassette changer positioned to take appropriate views (single or biplane).

c. Performer reviews with technologist the timing of the serial film program in relation to the injection of the contrast. Indicates whether more than one injection is anticipated, and sequence of programs for radiography of separate areas.

d. For hand injection, prepares or checks syringe with contrast. Attaches to teflon sheath or tubing and makes sure there is no air in system.

e. For automatic injection, checks that there is proper minimum amount of medium in syringe, that syringe is attached to injector tubing. Attaches tubing to needle or teflon sheath. Checks that there is no air in system. Checks on or orders the rate and pressure setting for entry force for automatic injector. Considers the pressure needed to inject the contrast medium into the vessel of interest given the technique, vessel, and other conditions involved.

f. Checks collimation and shielding.

g. As appropriate, has patient hold steady or strain (carry out Valsalva maneuver); coordinates with injection by activating the automatic injector or injecting by hand; orders technologist to activate serial changer at appropriate time.

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h. Performer may decide to view serial films for the first projection(s) ordered before continuing with second phase. If injecting and filming continuously, performer repeats appropriate steps for additional views and patient positions as described below. Arranges to see venograms as appropriate.

i. While first stage serial films are being processed, performer examines and talks to patient to evaluate how the patient has responded to the procedure and the injection. Detaches injector tubing. Reflushes entry site.

8. Performer looks at the first set of serial venograms on view boxes in sequence as soon as they are processed. Places frontal and lateral views together.

    a. Checks for technical quality and notes whether any irregularities are due to artifacts or actual pathological or abnormal conditions, and whether the views are technically adequate for medical interpretation. Performer may ask opinion of another radiologist.
    b. Determines whether the venograms adequately demonstrate the vessels and structures being studied, and provide sufficient information about any pathology, blockage, or distortion of the flow, the extent and location of any malformation, the presence of aneurysms, and other signs of abnormal structure or pathology.

TASK DESCRIPTION SHEET (continued)

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c. Performer determines whether to continue with second stage injection and filming and/or whether to repeat first stage. If decision is to repeat, indicates any changes needed to technologist and repeats additional steps.

9. If performer decides to go on with second stage injection and filming, proceeds as follows:

   a. Allows appropriate elapse of time between injections for patient to respond optimally.
   b. For ascending venography performer prepares for visualization of lower leg valves and muscle veins.

      i) Has cassette changer(s) set up for frontal and lateral views of lower leg. May decide to inject additional contrast before exercise.
      ii) Places weights so as to load knee or has this done. Then asks patient to raise and lower heel several times so as to contract and relax calf muscles.
      iii) Has patient hold still and orders serial filming of leg.

   c. For descending venography performer coordinates second injection and filming to demonstrate external and common iliac veins. Has patient hold still in supine position for injection and filming without straining. Repeats appropriate steps as described.
   d. Performer repeats review of venograms as described above until satisfied that the views are technically adequate to demonstrate the areas and conditions under study and to provide sufficient information to make possible a competent medical interpretation.

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   e. May decide to do bilateral study. If so, repeats steps as appropriate for opposite side.

10. Throughout procedure performer evaluates how the patient is responding. May decide to provide emergency care:

   a. Performer determines the severity of patient's reaction by listening for heartbeat, respiration; may check blood pressure; may take EKG reading using equipment on emergency cart.
   b. If patient has a severe reaction to the procedure or contrast medium, such as cardiac arrest, anaphylactic shock (exaggerated negative reaction to the foreign substance), bronchospasm or laryngospasm (stricture of bronchial tubes or larynx), hypotension (drop in blood pressure), cyanosis (bluish discoloration due to excessive concentration of reduced hemoglobin in blood), urticaria (vascular skin reaction), or violent sneezing, performer proceeds at once with emergency life support or measures to control the reaction.

      i) May have life support team called at once.
      ii) May administer oxygen or air using oxygen tank and mask or ambu bag; may clear airway using finger or tongue blade.
      iii) May decide to establish an airway by removing any dentures and, using a laryngoscope (to view larynx) insert an endotracheal tube.
      iv) May apply closed chest cardiac massage.
      v) Depending on ECG results may apply defibrillator by selecting watt seconds, applying and raising watt seconds until effective.

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vi) Depending on ECG results, may administer a prepared intracardial injection of a heart stimulant.
vii) May administer IV infusion; may order and administer a corticosteroid, an antihistamine or attropine.
viii) May administer Valium in solution through the injection tubing.

c. Performer decides whether the reaction is sufficiently controlled to proceed.

i) If performer decides to terminate procedure, notifies appropriate medical staff; orders aftercare as appropriate; has patient transported to appropriate location.
ii) Records patient's reactions and what was done on patient's chart. If appropriate, makes sure patient is informed of the type of drug that caused the reaction or explains to patient that he or she is allergic to the contrast solution (i.e. iodine-based solution).

d. If performer judges that patient displays a strong (but not emergency) allergic reaction:

i) Performer may order and administer a corticosteroid, an antihistamine or atropine.
ii) Records reaction and what was done. Explains if appropriate to patient that he or she is allergic to the contrast solution (i.e. iodine-based solution).

11. Performer decides when the radiographic examination is completed based on information on the venograms and the patient's condition. Informs technologist and other staff that procedure is to be terminated.

a. Performer returns to the patient. Reassures and explains what will happen next.
b. Removes any tourniquet or weights and connecting tube or syringe from teflon sheath or needle.
c. Performer gently and slowly withdraws the needle taking care not to injure the vessel or enlarge the wound at the entry point.
d. Performer compresses the vessel proximal to or at the puncture site with the fingertips and/or sterile gauze for an appropriate amount of time.
e. Performer applies or orders pressure dressing to be kept in place appropriate amount of time.
f. Performer may order fluids to be given intravenously or by mouth. May order bed rest for appropriate period while patient recovers from effects of procedure.
g. Arranges to have puncture hole(s) examined in follow up check. Informs patient or attending staff to report further oozing of blood or swelling.
h. Performer may order careful observation of patient including vital signs, urinary output, and skin care. May order tests, fill out order forms. May order medication.
i. Has appropriate sanitary clean up procedures carried out.
j. If requested, calls surgeon or clinician and reports preliminary results and findings.

12. Performer records impressions of procedure on patient's chart:

TASK DESCRIPTION SHEET (continued)

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This is page 10 of 10 for this task.

List Elements Fully	List Elements Fully
a. Preliminary findings. b. How patient tolerated procedure. c. Any special nursing follow-up recommended, tests ordered, records and observation required, medication, later studies ordered. d. May sign chart, requisition sheet or order forms.	

TASK DESCRIPTION SHEET

Task Code No. 472

This is page 1 of 11 for this task.

1. What is the output of this task? (Be sure this is broad enough to be repeatable.)

Pt. examined,reassured;decisions made on going ahead, route,technique,site of puncture,contrast medium,injection,serial filming;preparatory orders given;site anesthetized;artery punctured;guide wire and catheter advanced under fluoroscopic control;injection and filming coordinated;aortograms reviewed,and/or procedure continued until final approval;emergency care given;instruments removed;site compressed;orders for after care,tests,urogram,medical impressions recorded.

2. What is used in performing this task? (Note if only certain items must be used. If there is choice, include everything or the kinds of things chosen among.)

X-ray requisition form;pt.'s medical chart,prior films,scans;pen;view boxes;sterile tray with antiseptic,saline,anticoagulant,swabs,tape,scissors,gauze, pressure dressings,local anesthetic,syringes,puncture needle,scalpels,guide wires,catheters;automatic injector;iodine-based contrast;x-ray table;film changer(s);fluoroscope,TV monitor;emergency cart; sterile gown,gloves,drape;shielding

3. Is there a recipient, respondent or co-worker involved in the task? Yes...(X) No...( )

4. If "Yes" to q. 3: Name the kind of recipient, respondent or co-worker involved, with descriptions to indicate the relevant condition; include the kind with whom the performer is not allowed to deal if relevant to knowledge requirements or legal restrictions.

Any pt.;authorized adult;attending MD;radiologist;anesthesiologist;surgeon;radiologic technologist;nurse

5. Name the task so that the answers to questions 1-4 are reflected. Underline essential words.

Conducting catheter thoracic aortography of any pt. by examining,reassuring pt.;obtaining consent;deciding on route,technique,site,prior preparation;deciding whether to go ahead,pressure,timing for contrast injection,rate,speed for serial filming;injecting anesthetic;making puncture and advancing catheter and guide wire under fluoroscopic control;coordinating pressure injection of contrast and filming;evaluating and ordering,approving additional injections and angiograms as appropriate;providing emergency care;removing instruments;ordering after care,tests,delayed films;recording orders,medical impressions.

List Elements Fully

Performer receives the x-ray requisition form and medical chart of a patient scheduled for catheter thoracic aortography (radiographic contrast study of the thoracic aorta, its great branches, and the aortic arch by means of selective catheterization) prior to the procedure, such as on the previous day or evening.

1. Performer reads the patient's medical history and requisition form to review the case or to become familiar with materials seen earlier in consultation in order to make decisions about the conduct of the radiographic study and to check on the request of the referring physician:
   a. Performer notes the patient's age, sex, weight, height, the nature and location of the suspected pathology or symptomology, such as vascular lesions, evidence of vascular occlusive disease, soft tissue tumors, aortic insufficiency or stenosis, aneurysms or congenital anomalies.
   b. Performer notes the purpose of the requested study such as for information for use prior to or after surgery or for diagnosis. Notes name of referring clinician or surgeon. Notes whether abdominal aorta and/or any branches of the thoracic aorta are to be visualized.

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6. Check here if this is a master sheet..(X)

TASK DESCRIPTION SHEET (continued)

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List Elements Fully

c. Performer reviews the diagnostic information already obtained, including any prior radiographs, radioisotope scans, ultrasonograms, results of clinical tests, lab tests, EKG, and vital signs.

d. Performer notes relevant prior history such as prior incidents of vascular constriction, removal of any section of the vascular system, grafts and their sites, history of atherosclerosis, heart disease, renal, pulmonary, or liver disease, history of allergies or indications of allergy to iodine-based contrast media. If already done, notes results of allergy test,clotting time tests. Notes stage of female patient's menstrual cycle, any possibility of pregnancy,whether on oral contraceptive. Notes whether patient has an infectious or communicable condition.

e. Notes whether prior orders have been given to improve patient's clinical condition; if so, notes progress.

f. Performer notes recommendations on catheterization such as site and route of entry and use of equipment and materials. Notes recommendations on use of general or local anesthesia.

g. Checks to see whether patient or authorized adult has signed consent for procedure. If not, may decide to obtain personally.

h. Performer may discuss case with referring clinician, specialist, or surgeon to obtain additional information. May arrange for attending physician, anesthesiologist and/or surgeon to accompany performer in examination of patient on day prior to the procedure.

2. Performer visits patient and any authorized adult at bedside or in appropriate location. May be accompanied by clinician, anesthesiologist,surgeon,or appropriate specialist.

List Elements Fully

a. Performer greets patient and/or authorized adult and explains that a brief examination will occur. If any colleagues are with performer, performer introduces them.

b. Performer reads patient's chart. Notes any new clinical developments, response to care or medication. May ask patient or accompanying adult about symptoms and allergies. Examines the patient for relevant symptoms and general state. Reassures and answers questions. If not already done, performer determines whether there is any possibility of pregnancy in the case of a female patient, whether patient has been taken off oral contraceptive.

c. Performer considers whether there have been changes in the patient's condition since the decision was made to do the procedure,and considers whether there are contraindications to going ahead with the procedure. May confer with specialist, clinician, or surgeon;discusses patient's current condition. Decides whether to proceed, cancel, or delay procedure based on assessment of patient's current condition and any discussion.

d. If performer decides not to have procedure done, may discuss with clinician. Records reasons for cancellation and any recommendations for alternative procedure (such as intravenous study) on patient's chart. Informs staff of cancellation and discusses with patient.

e. Performer may decide to delay procedure, have patient undergo treatment to improve clinical condition, such as treatment for blood pressure, infectious condition, or malnutrition. Discusses

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as appropriate and has orders given for care of patient. If patient has been on anticoagulant therapy, may order cessation of therapy until prothrombin and/or clotting times are within normal levels.

f. If performer decides to proceed, examines femoral and/or axillary arterial pulses to determine best vascular approach and entry site(s):

  i) Notes strength and expansive nature of the pulsations, presence of bruits (murmurs), presence of grafts, presence and location of ischemic symptoms. Reviews recommendations.
  ii) Performer considers the condition of the pulses, location of the pathology, areas of interest, clinical and surgical history, age of patient and nature of symptoms. Considers whether the abdominal aorta will be studied.
  iii) Selects side and puncture site considering condition of area, patient's age and convenience for the procedure. Avoids puncture site where there is severe atherosclerotic involvement, scars or grafts.
  iv) Performer examines and records presence and character of pulses at, and distal to, the artery to be punctured.

g. If performer decides to proceed and a consent for the procedure has not been obtained, explains (before any sedation) to the patient or guardian in comprehensible language what will occur in the procedure, its purpose, and the dangers to the patient involved. Performer explains the alternatives; answers questions.

  i) When the performer is sure that the patient understands the risks, asks the patient for signature on consent form and checks that it is properly signed.
  ii) If a guardian is to sign, performer explains to the individual as appropriate.
  iii) If a consent is not agreed to, performer postpones procedure until it is obtained. May discuss with appropriate physician or individuals and/or with patient. Does not proceed unless consent is obtained.

List Elements Fully

h. Performer decides on the type of equipment to use based on institutional facilities and nature of study:

  i) May order serial single or biplane cassette changer, depending on the area of interest and nature of pathology.
  ii) May indicate types, sizes and lengths of catheter(s), whether preshaped, closed-end, with side holes, whether radiopaque. May specify type of guide wire (such as double curve tip), size needle, type of contrast solution and amount.
  iii) May order EKG (ECG) monitoring. May have co-worker assist.

i. Performer may make preliminary decisions on care of patient:

  i) Decides on use of general and/or local anesthetic. May discuss with anesthesiologist. If a general anesthetic is to be administered, performer arranges to have staff ready at the appropriate time.
  ii) Performer makes final decisions on prior preparation of the patient such as sedation, period for withholding of food and/or

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drink, or hydration, as appropriate; use of prior IV drip, cleansing enema; shaving of entry site (s); prior administration of antihistamine, medications to deal with problems of blood clotting.

j. Performer records orders as appropriate so that patient and equipment can be prepared and staff assigned. May sign requisition; places for scheduling.

k. Reviews with patient the procedures that will occur.

3. Just prior to the time for which the procedure is scheduled, the performer reviews all the relevant medical information and the patient's chart. Reviews relevant prior radiographs. Notes any new developments.

a. Performer greets patient in examination room. May question about symptoms; reassures and explains what will occur.

b. Performer checks that all prior preparatory procedures have been carried out.

i) Checks report on electrolyte levels, blood clotting time, vital signs.

ii) Checks that any orders for hydration, starting of IV infusion, prior administration of medication or sedation have been carried out, and at appropriate time. If not, arranges to have these done and/or procedure delayed.

c. Performer considers whether patient's current condition presents any contraindications to going ahead with the procedure. May have clinician or specialist called; discusses patient's condition and any alternative steps. Decides whether to proceed or not based on evaluation of patient's condition and contraindications.

List Elements Fully

d. If performer decides not to proceed, records reasons and any recommendations on patient's chart. Informs appropriate co-worker of cancellation and has patient returned to room. If appropriate, orders rescheduling of patient or scheduling for alternative procedure.

e. Performer examines puncture site (s) to review earlier decisions. Makes sure no swelling or tenderness is present. Considers alternative puncture route or site(s) if appropriate.

f. If patient is pediatric patient or if general anesthesia has been suggested for adult, performer may reconsider whether general anesthesia is still warranted; may decide to order if patient's behavior and condition suggest the need. If general anesthesia is to be carried out, performer discusses with anesthesiologist when it is to be administered and plans to coordinate with anesthesiologist.

g. May order sedation and/or IV drip if appropriate and not already administered. Has puncture site and possible alternative sites shaved and prepared.

h. Performer may explain or demonstrate use of equipment to a child to allay fears and enlist cooperation; answers questions. Explains that patient will be asked to hold still from time to time. Indicates what will happen, what pain might be experienced, what reaction to expect to contrast, and what cooperation will be needed. Stresses need to maintain positions when ordered.

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List Elements Fully

4. Performer makes final decisions on technique and surgical procedures:
    a. Decides on or checks sizes and types of needles, catheters, guide wires. Checks or orders type,amount of iodine-based aqueous contrast material, local anesthetic, automatic injector, use of biplane or single plane serial changer.
    b. Performer decides on program for seriography. Informs technologist of the number of films to be taken, the per-second intervals, and the number of series anticipated. Has equipment checked.
    c. If a biplane study is involved, selects frontal and lateral projections or indicates desired oblique angulations. Indicates whether biplane films will be taken simultaneously or sequentially.
    d. Has technical factors set for fluoroscopy.
    e. Performer orders scout film(s) (of chest and abdomen if abdominal aorta is to be studied) as appropriate for single or biplane views. Makes sure proper shielding is being used.
        i) Performer places the processed scout films on view boxes and examines as soon as they are ready. Performer considers whether the areas of interest are visible, whether the technique is satisfactory, and whether the position(s) of the patient are correct.
        ii) If the scouts are not satisfactory, performer indicates the needed changes in technique or in the patient's position to the radiologic technologist.
    f. If general anesthesia is to be administered, indicates to anesthesiologist when procedure is to start and allows for appropriate timing.
    g. Informs appropriate co-workers of decisions so that patient and materials can be prepared.

5. Performer returns to patient in procedure room when informed that patient and equipment are ready:
    a. Checks whether patient has been properly shielded, immobilized, and prepared for sterile puncture procedure. If not acceptable, indicates the needed adjustments. May decide to immobilize personally.
    b. Checks sterile tray prepared for procedure. Requests any missing objects.
        i) Performer checks that appropriate needle and catheter sizes and lengths are available and catheters preformed if appropriate. Checks safety guide wires. May bend catheters personally.
        ii) Checks that syringes with saline and anticoagulant solution are prepared, that syringes with contrast medium are ready.
        iii) Checks appearance of contrast medium to be sure there is no chemical deterioration; checks amount.
        iv) May prepare syringe with local anesthetic or checks.
    c. If patient has special equipment such as IV or indwelling catheter, performer makes sure that these are being monitored. May check that ECG monitoring equipment is present. Checks that emergency cart is present.

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d. Checks that seriography equipment is ready for use, that technical factors are set for seriography and fluoroscopy, and that equipment for pressure injection is checked and ready for use.

e. Dons protective lead garments and sterile gown and gloves when appropriate. Checks staff shielding.

f. If patient is coherent, performer explains what will be done. Answers patient's questions as appropriate. Reassures patient and does so as deemed needed throughout procedure.

g. If general anesthesia is to be administered, checks with anesthesiologist to be sure that the patient is ready for procedure to begin.

6. Performer proceeds to prepare the puncture site using sterile technique:

a. Has patient positioned appropriately for the injection site chosen so as to provide access.

   i) For puncture of femoral artery positions patient for access below the inguinal ligament as high as possible, but allowing for later compression of the vessel proximal to the puncture site.

   ii) For axillary puncture has patient lie supine with arm abducted and elbow bent, providing access to selected area in the axilla.

   iii) Performer locates the vessel for puncture visually and/or by feeling for arterial pulsation in the location selected. May choose more palpable position in vessel allowing for later compression.

b. Prepares the site for injection of the local anesthetic and puncture by swabbing with prepared antiseptic solution. Covers surrounding areas with sterile drapes, leaving only small area of injection and puncture uncovered.

c. Checks amount of local anesthetic to be injected as shown by nurse in syringe, or draws anesthetic into sterile syringe. Checks no air is present and inserts needle intradermally and subcutaneously; injects. Makes sure to infiltrate the skin and the sheath of the artery on both sides of the vessel. Removes needle. Waits for area to become anesthetized.

7. Performer proceeds with selective "Seldinger" catheterization as follows:

a. If patient is conscious, explains when patient is to hold steady for puncture.

b. Performer feels for the appropriate arterial pulse by palpating with fingers. Makes an incision or nick through the skin with a sterile scalpel at the site where the needle and catheter will enter.

c. Performer inserts puncture needle tip (appropriately sized hollow needle with sharp cutting inner stylus) into incision while palpating and fixing the artery. Performer angles needle to enter along the lateral side of the vessel with the tip directed towards the aorta (retrograde). May attempt to enter only the anterior wall.

d. Performer pulls out the needle's inner stylus and withdraws the needle slowly until a characteristic "pop" is felt and a vigorous jet of arterial blood is obtained. May pull back on needle, reinsert, or make other incisions until artery is successfully entered.

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List Elements Fully | **List Elements Fully**

e. Performer inserts a curved tip safety guide wire into the needle and advances this into the vessel in the direction of the planned route for catheterization. May advance guide wire before removing needle and introducing catheter.

f. Once the guide wire is inserted, performer withdraws the hollow needle, compressing the artery to reduce the bleeding. Cleans blood off guide wire. Inserts the appropriate size catheter by threading catheter over the guide wire and into the artery. If abdominal aorta is to be visualized first by way of femoral route, performer may use appropriate smaller catheter first and replace with larger catheter for thoracic aorta.

g. Performer decides whether to advance the catheter using the guide wire as a leader or to remove guide wire. If so decided, removes guide wire.

h. Performer may check position of catheter at this point:

   i) Performer uses syringe prepared with a small amount of the contrast solution. Checks that medium is appropriate. Connects syringe to the catheter.
   ii) Positions the overhead fluoroscope unit over the patient; may have lights in room dimmed; activates the fluoroscope; adjusts technical factors or has this done.
   iii) Performer has patient hold still. Injects a small amount of the solution into the artery for viewing location of catheter tip and guide wire.
   iv) Locates site of entry of catheter and checks position of catheter within vessel by viewing on TV monitor. Performer judges whether catheter is correctly inserted in lumen of vessel rather than in an intramural or extravascular position by viewing on TV monitor and watching flow of test dose.
   v) Adjusts position of guide wire and/or catheter to be sure that the catheter is free to pass along the lumen of the vessel.
   vi) If performer judges that entry through site chosen cannot be properly accomplished, performer may decide to enter from the opposite artery or alternative route if appropriate. If so, performer repeats appropriate steps for new location after caring for initial site.

8. Performer advances the catheter (with or without guide wire as a leader) under fluoroscopic control as appropriate to planned injection site:

   a. In advancing the catheter and/or guide wire, performer is careful not to force passage.
   b. If an obstacle is encountered, performer checks position using fluoroscopy, syringe and small amount of contrast solution (as described above). Injects a small amount of contrast into the artery through the catheter, activates fluoroscope, and views on the TV monitor. Determines problem and redirects guide wire or catheter as appropriate. Performer evaluates entry route if appropriate and may choose alternative route or termination as described. Performer repeats appropriate steps for any new location after properly caring for initial site.
   c. For femoral route performer advances guide wire and/or catheter to the aortic bifurcation. Checks by using fluoroscopic control.

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i) Advances and positions catheter in the abdominal aorta if it is to be visualized first.

ii) For thoracic aorta advances catheter so that tip is at the midpoint of the ascending aorta. May position tip of catheter above the valve if appropriate. If so, is careful not to enter a coronary artery.

d. For axillary route performer advances guide wire and/or catheter retrogradely along axillary artery into subclavian artery and thence into ascending aorta with catheter tip at the midpoint.

e. After checking location of catheter using test dose and fluoroscopic control, performer removes guide wire if not already done.

f. Performer attaches syringe prepared with saline and/or anticoagulant to catheter. Flushes catheter periodically to avoid clotting and to keep catheter clear.

9. Performer prepares for immediate injection of contrast and filming:

a. Has patient positioned as appropriate for single plane right posterior oblique projection at 40° - 60°, or biplane frontal and lateral projections (or steep right and left posterior oblique projections) as appropriate to the nature of the pathology.

b. Makes sure proper (close) collimation will be observed, that appropriate shielding is in place.

c. Performer checks that materials are ready for pressure injection of the contrast solution and for serial filming. Checks that patient is properly immobilized, shielded and positioned. Checks coordination of injection with filming:

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i) Checks that the automatic injector (used for introduction of the contrast solution under pressure) is loaded with proper minimum amount of medium in syringe; checks that syringe is attached to injector tubing. Attaches tubing to catheter. Checks that there is no air in system.

ii) Performer checks on or orders the rate and pressure setting for the entry force for the automatic injector. Considers the pressure needed to inject the contrast medium into the vessel of interest given the technique, vessel, and other conditions involved.

iii) Performer has overhead x-ray tube(s) (single or biplane) positioned for serial filming; checks with the technologist the rate of speed and length of time selected. Checks rate in relation to the series of injections.

d. Checks with anesthesiologist (if present) and/or EKG monitor to determine patient's condition.

10. Performer directs injection and filming:

a. Performer may enter control room. Has patient hold steady, if conscious, or awaits indication from anesthesiologist that respiration has been suspended.

b. Performer tells technologist when to start the automatic film changer(s) (to make sure of proper functioning) to take the series of preprogrammed radiographs. Once changer has started, performer activates the automatic injector.

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c. Performer has serial aortograms processed at once.

11. While serial films are being processed, performer examines and talks to patient (if conscious) to evaluate how the patient has responded to the procedure and the injection.

    a. Detaches injector tubing; reflushes catheter.
    b. If ECG is being monitored, evaluates any changes during initial injection as possible contraindication for any additional injections.
    c. May decide to provide emergency care at any time throughout procedure if patient shows signs of adverse reactions.

12. Performer looks at the first set of serial aortograms on view boxes in sequence as soon as they are processed. Places biplane views together.

    a. Checks for technical quality and notes whether any irregularities are due to artifacts or actual pathological or abnormal conditions, and whether the views are clear enough for medical interpretation. Performer may ask opinion of another radiologist.
    b. Determines whether the aortograms adequately demonstrate the vessel and structures being studied, and provide sufficient information about any pathology, blockage, or distortion of the flow, the extent and location of any anomalies, malformation, the presence of aneurysms, and other signs of abnormal structure or pathology.
    c. Performer considers whether to inject additional contrast and/or continue serial filming, repeat injection and filming with change in technical factors or patient position. Considers using alternate route. If viewing abdominal aortograms, considers whether to go ahead with thoracic aortography. Considers the patient's condition, the contraindications, the information already supplied, and the urgency. May discuss with anesthesiologist and/or clinician.
    d. If the thoracic aorta is to be entered after the abdominal aorta has been entered, performer may reinsert guide wire until it reaches the proximal catheter tip. Uses fluoroscopic control. May then remove smaller catheter and thread the larger thoracic catheter over the guide wire as described. Advances catheter (with guide wire as leader if so decided) into thoracic aorta as described above.
    e. If performer is to catheterize a branch of the aorta at this time, performer reintroduces the guide wire into the catheter. Under fluoroscopic control, the performer sequentially withdraws and reinserts the catheter as appropriate to reach the branch of interest.
    f. For additional puncture sites and catheterization repeats appropriate steps as described above.
    g. For additional injections, change of position, change in technical factors, performer reviews decisions on injection pressure, amount of contrast, rate and speed of serial programs; indicates what is needed to staff and repeats as appropriate. Allows appropriate elapse of time between injections for patient to respond optimally.
    h. Repeats relevant steps for repeat or additional views and locations as described above. Repeats review

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of radiographs as described above until satisfied that the angiograms are technically adequate to demonstrate the areas and conditions under study and to provide sufficient information to make possible a competent medical interpretation.

13. Throughout procedure performer evaluates how the patient is responding. May decide to provide emergency care:

    a. Performer determines the severity of the reaction by listening for heartbeat, respiration; may check blood pressure; may take EKG reading, using equipment on emergency cart.

    b. If patient has a severe reaction to the procedure or contrast medium, such as cardiac arrest, anaphylactic shock (exaggerated negative reaction to the foreign substance), bronchospasm or laryngospasm (stricture of bronchial tubes or larynx), hypotension (drop in blood pressure), cyanosis (bluish discoloration due to excessive concentration of reduced hemoglobin in blood), urticaria (vascular skin reaction), or violent sneezing, performer proceeds at once with emergency life support or measures to control the reaction.

        i) May call anesthesiologist or has life support team called at once.
        ii) May administer oxygen or air using oxygen tank and mask or ambu bag; may clear airway using finger or tongue blade.
        iii) May decide to establish an airway by removing any dentures and, using a laryngoscope (to view larynx) insert an endotracheal tube.
        iv) May apply closed chest cardiac massage.

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        v) Depending on ECG results may apply defibrillator by selecting watt seconds, applying, and raising watt seconds until effective.
        vi) Depending on ECG results may administer a prepared intracardial injection of a heart stimulant.
        vii) May administer IV infusion; may order and administer a corticosteroid, an antihistamine or atropine.
        viii) May administer Valium in solution through the injection catheter.

    c. Performer decides whether the reaction is sufficiently controlled to proceed.

        i) If performer decides to terminate procedure, notifies appropriate medical staff; orders aftercare as appropriate; has patient transported to appropriate location.
        ii) Records patient's reactions and what was done on patient's chart. If appropriate, makes sure patient is informed of the type of drug that caused the reaction or explains to patient that he or she is allergic to the contrast solution (i.e. iodine-based solution).

    d. If performer judges that patient displays a strong (but not emergency) allergic reaction:

        i) Performer may order and administer a corticosteroid, an antihistamine or atropine.
        ii) Records reaction and what was done. Explains if appropriate to patient that he or she is

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allergic to the contrast solution.

14. Performer decides when the angiographic examination is completed based on information on the angiograms and the patient's condition. Informs anesthesiologist (if present), technologist and other staff that procedure is to be terminated.

    a. Performer returns to the patient. If patient is conscious, performer reassures patient and explains what will happen next.
    b. Removes any connecting tube or syringe from catheter.
    c. Performer gently and slowly withdraws the catheter. Manipulates catheter by turning and pulling carefully, taking care not to injure the vessel or enlarge the wound at the entry point.
    d. Performer compresses the vessel proximal to or at the puncture site with the fingertips and/or sterile gauze for an appropriate amount of time.

        i) Does not totally occlude the artery. Checks that there is a pulsation distal to the puncture site and no hematoma at the site.
        ii) May have a staff member continue the compression for the time needed. Makes changeover so as to maintain pressure by withdrawing own hands from under those of the relieving staff member once they are in place.

    e. Performer applies or orders pressure dressing to be kept in place appropriate amount of time.
    f. Performer may order fluids to be given intravenously or by mouth. May order bed rest for appropriate period while patient recovers from effects of procedure, and close observation for a number of hours.
    g. Arranges to have puncture holes examined in follow up check. Informs patient or attending staff to report further oozing of blood or swelling.
    h. Performer may order careful monitoring of patient including vital signs, urinary output, and skin care. May order tests, fill out order forms. May order medication.
    i. May order delayed urogram appropriate amount of minutes after last injection.
    j. Has appropriate sanitary clean up procedures carried out.
    k. If requested, calls surgeon or clinician and reports preliminary results and findings.

15. Performer records impressions of procedure on patient's chart:

    a. Preliminary findings.
    b. How patient tolerated procedure.
    c. Any special nursing follow-up recommended, tests, delayed films ordered, records and observation required, medication, later studies ordered.
    d. May sign chart, requisition sheet or order forms.

TASK DESCRIPTION SHEET

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This is page 1 of 18 for this task.

1. What is the output of this task? (Be sure this is broad enough to be repeatable.)

Pt. examined, reassured; decisions made on going ahead, route, technique, site of puncture(s), contrast medium, injection, type of filming; preparatory orders given; site anesthetized; artery punctured; guide wire and catheter advanced under fluoroscopic control; injection and filming coordinated; aortograms reviewed, and/or selective catheterization or pharmocoangiography continued until final approval; emergency care given; instruments removed; site compressed; orders for after care, tests, urogram, medical impressions recorded

2. What is used in performing this task? (Note if only certain items must be used. If there is choice, include everything or the kinds of things chosen among.)

X-ray requisition form; pt.'s medical chart, prior films, scans; pen; view boxes; sterile tray with antiseptic, saline, anticoagulant, vasoactive drugs, swabs, tape, scissors, gauze, pressure dressings, local anesthetic, syringes, puncture needle, scalpels, guide wires, catheters; automatic injector; iodine-based contrast; x-ray table; film changer(s); fluoroscope, TV monitor; spot film device; videotape device; emergency cart; sterile gown, gloves, drape; shielding; stereo viewer

3. Is there a recipient, respondent or co-worker involved in the task? Yes...(x) No...( )

4. If "Yes" to q. 3: Name the kind of recipient, respondent or co-worker involved, with descriptions to indicate the relevant condition; include the kind with whom the performer is not allowed to deal if relevant to knowledge requirements or legal restrictions.

Any pt.; authorized adult; attending MD; radiologist; anesthesiologist; surgeon; radiologic technologist; nurse

5. Name the task so that the answers to questions 1-4 are reflected. Underline essential words.

Conducting catheter abdominal aortography and/or selective visceral arteriography of any pt. by examining, reassuring pt.; obtaining consent; deciding on site route, technique, prior preparation; deciding whether to go ahead, pressure for contrast injection, type of filming, special techniques; injecting local anesthetic; making puncture(s); advancing catheter and guide wire under fluoroscopic control; coordinating pressure injection of contrast and filming; evaluating aortograms; deciding on selective, superselective catheterization, pharmacoangiography as appropriate; providing emergency care; removing instruments; ordering after care, tests, delayed films; recording orders, medical impressions.

List Elements Fully

Performer receives the x-ray requisition form and medical chart of a patient scheduled for catheter abdominal aortography and/or selective abdominal visceral arteriography (radiographic contrast study of the abdominal aorta, and/or the renal, celiac, hepatic, adrenal, superior and/or inferior mesenteric, and/or retroperitoneal arteries and/or their branches by means of selective catheterization) prior to the procedure, such as on the previous day or evening.

1. Performer reads the patient's medical history and requisition form to review the case or to become familiar with materials seen earlier in consultation, in order to make decisions about the conduct of the radiographic study and to check on the request of the referring physician:

   a. Performer notes the patient's age, sex, weight, height, the name of the referring clinician or surgeon. Notes the nature and location of the suspected pathology or symptomology, such as disease or abnormalities in the abdominal circulatory system, kidneys, liver, spleen, pancreas, retroperitonium, portal system, gastrointestinal bleeding, aneurysms, intraabdominal neoplasms, low flow syndrome, portal hypertension, vascular lesions, evidence

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6. Check here if this is a master sheet..(x)

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of vascular occlusive disease, soft tissue tumors, stenosis, or congenital anomalies.

b. Performer notes the purpose of the requested study such as for information for use prior to or after surgery, preliminary or supplementary diagnosis, to evaluate progress of therapy.

c. Notes whether aortography is requested and/or selective visceral arteriography and/or "super-selective" arteriography, whether bilateral and/or simultaneous or sequential catheterization is suggested, use of pharmacoangiography. Notes whether patient to undergo study to diagnose gastrointestinal bleeding is to be treated as emergency patient.

d. Performer reviews the diagnostic information already obtained, including any prior radiographic studies, radioisotope scans, ultrasonograms, results of clinical tests, lab and sensitivity tests, EKG, vital signs, clotting time tests.

e. Performer notes relevant prior history such as prior incidents of vascular constriction, removal of any section of the vascular system, splenectomy (if portography is requested), grafts and their sites, history of atherosclerosis, heart disease, hypertension, renal, pulmonary, or liver disease, thrombosis, pheochromocytoma, abnormal bleeding tendency, anticoagulation therapy, history of allergies or indications of allergy to iodine-based contrast media. Notes stage of female patient's menstrual cycle, any possibility of pregnancy, whether on oral contraceptive. Notes whether patient has an infectious or communicable condition,

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especially local infection at possible puncture site.

f. Notes whether prior orders have been given to improve patient's clinical condition; if so, notes progress.

g. Performer notes recommendations on catheterization such as site and route of entry, and use of equipment and materials. Notes recommendations on use of general or local anesthesia.

h. Checks whether patient or authorized adult has signed consent for procedure. If not, may decide to obtain personally before sedation is given.

i. Performer may discuss case with referring clinician, specialist, or surgeon to obtain additional information. May arrange for attending physician, anesthesiologist and/or surgeon to accompany performer in examination of patient on day prior to the procedure.

2. Performer visits patient and any authorized adult at bedside or in appropriate location. May be accompanied by clinician, anesthesiologist, surgeon, or appropriate specialist.

   a. Performer greets patient and/or authorized adult and explains that a brief examination will occur. If any colleagues are with performer, performer introduces them.

   b. Performer reads patient's chart. Notes any new clinical developments, response to care or medication. May ask patient or accompanying adult about symptoms and allergies. Examines the patient for relevant symptoms and general state. Reassures and an-

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swers questions. If not already done, performer determines whether there is any possibility of pregnancy in the case of a female patient, whether patient has been taken off any oral contraceptive.

c. Performer considers whether there have been changes in the patient's condition since the decision was made to do the procedure, and considers whether there are contraindications to going ahead with the procedure. May confer with specialist, clinician, or surgeon; discusses patient's current condition. Decides whether to proceed, cancel or delay procedure based on assessment of patient's current condition and any discussion.

d. If performer decides to proceed, examines femoral and/or axillary arterial pulses to determine best vascular approach and entry site(s):

   i) Notes strength and expansive nature of the pulsations, presence of bruits (murmurs), presence of grafts, presence and location of ischemic symptoms, local infection. Reviews recommendations.
   ii) Performer considers the condition of the pulses, location of the pathology, areas of interest, clinical and surgical history, age of patient and nature of symptoms. Considers whether selective visceral branches and subbranches will be studied.
   iii) Selects side and puncture site (or bilateral catheterization) considering condition of area, patient's age and convenience for the procedure. Avoids puncture site where there is severe atherosclerotic involvement, scars or grafts. Favors right femoral artery over left and left axillary artery if femoral pulses are weak.
   iv) Performer examines and records presence and character of pulses at, and distal to, the artery(s) to be punctured.

e. If selective visceral catheterization is requested, performer may decide on best method where options are available:

   i) May consider use of a vasoconstrictor if adrenal glands, retroperitoneal arteries or pancreatic arteries are involved.
   ii) For arterial portography or study of pancreas, may decide on injecting either the celiac or superior mesenteric artery or both, sequential or simultaneous injection if both. For simultaneous injection checks that both femoral sites can be punctured. If patient has no spleen, selects superior mesenteric artery.
   iii) May consider use of a vasodilator to visualize small vessels of the inferior mesenteric artery and in conjunction with vasoconstriction to view pancreatic arteries.
   iv) May choose the vessels to opacify for studies of vascular disease, gastrointestinal bleeding, study of retroperitoneal disease.
   v) May decide on inclusion of views of the venous phase of circulation.

f. If performer decides not to have procedure done, may discuss with clinician. Records reasons for cancellation and any recommendations for alternative procedure,

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such as translumbar aortography on patient's chart. Informs staff of cancellation and discusses with patient. g. Performer may decide to delay procedure, have patient undergo treatment to improve clinical condition, such as treatment for blood pressure, anemia, infectious condition, or malnutrition, or to allow for elimination of barium. Discusses as appropriate and has orders given for care of patient. If patient has been on anticoagulant therapy, may order cessation until prothrombin and/or clotting times are within normal levels. May order cessation of oral contraceptive if not already done. With emergency patient may determine whether delay is contraindicated. h. If performer decides to proceed and a consent for the procedure has not been obtained, performer may explain to the patient or guardian in comprehensible language what will occur in the procedure, its purpose, and the dangers to the patient involved. Performer explains the alternatives; answers questions. i) When the performer is sure that the patient understands the risks, asks the patient for signature on consent form and checks that it is properly signed. ii) If a guardian is to sign, performer explains to the individual as appropriate. iii) If a consent is not agreed to, performer postpones procedure until it is obtained. May discuss with appropriate physician or individuals and/or with patient. Does not proceed unless consent is obtained.	i. Performer decides on the type of equipment to use based on institutional facilities and nature of study: i) May order serial single or biplane cassette changer, stereo filming, videotape, magnification technique, spot filming, depending on area of interest, purpose of study and nature of pathology. Orders pressure injector. If magnification is to be used, orders x-ray tube with an appropriately small fractional focal spot and a table capable of adequate elevation. ii) May indicate types, sizes and lengths of catheter(s), whether j-shaped, preshaped, closed-end, with side holes, whether radiopaque. May specify type of safety guide wires, floppy wire, size and type of needle, type of contrast solution. Chooses amount based on size of patient and optimal cumulative amount for the procedure. iii) May order vasodilator and/or vasoconstrictor for use in selective visceral procedures. j. Performer may make preliminary decisions on care of patient: i) Decides on use of general and/or local anesthetic. May discuss with anesthesiologist. If a general anesthetic is to be administered, performer arranges to have staff ready at the appropriate time. ii) Performer makes final decisions on prior preparation of the patient such as sedation, period for withholding of food and/or

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drink, or hydration, as appropriate; use of prior IV drip, cleansing enema; shaving of entry site (s); prior administration of antihistamine, medications to deal with problems of blood clotting, fluctuations in blood pressure.

iii) May order EKG (ECG) monitoring, team to monitor vital signs, IV fluids and/or administer transfusions. May have co-worker assist.

k. Performer records orders as appropriate so that patient and equipment can be prepared and staff assigned. May sign requisition; places for scheduling.

l. Reviews with patient the procedures that will occur.

3. Just prior to the time for which the procedure is scheduled, the performer reviews all the relevant medical information and the patient's chart. Reviews relevant prior radiographs. Notes any new developments.

a. Performer greets patient in examination room. May question about symptoms; reassures and explains what will occur.

b. Performer checks that all prior preparatory procedures have been carried out.

i) Checks report on electrolyte levels, blood clotting time, vital signs. May have patient treated for shock.

ii) Checks that any orders for hydration, starting of IV infusion or transfusion, prior administration of medication and/or sedation have been carried out, and at appropriate time. If not arranges to have these done and/or procedure delayed.

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c. Performer examines puncture site (s) to review earlier decisions. Makes sure no swelling or tenderness is present. Considers alternative puncture site(s) if appropriate. Indicates puncture site(s) to staff.

d. Performer orders scout film(s) of abdomen (including distal esophagus for arterial portography and, if appropriate, gastrointestinal bleeding) as appropriate for single or biplane views. Makes sure proper shielding is being used.

i) Performer places the processed scout films on view boxes and examines as soon as they are ready. Performer considers whether the areas of interest are visible, whether the technique is satisfactory, and whether the position(s) of the patient are correct.

ii) If the scouts are not satisfactory, performer indicates the needed changes in technique or in the patient's position to the radiologic technologist.

iii) Performer considers whether any barium traces from earlier examination or contents of gastrointestinal tract must be cleared. May order further cleansing or delay in procedure.

e. Performer considers whether patient's current condition presents any contraindications to going ahead with the procedure. May have clinician or specialist called; discusses patient's condition and any alternative steps. Decides whether to proceed or not

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based on need, evaluation of patient's condition and contraindications.

f. If performer decides not to proceed, records reasons and any recommendations on patient's chart. Informs appropriate co-worker of cancellation and has patient returned to room. If appropriate, orders rescheduling of patient or scheduling for alternative procedure.

g. If patient is pediatric patient or if general anesthesia has been suggested for adult, performer may reconsider whether general anesthesia is still warranted; may decide to order if patient's behavior and condition suggest the need. If general anesthesia is to be carried out, performer discusses with anesthesiologist when it is to be administered and plans to coordinate with anesthesiologist.

h. May order sedation and/or IV drip or transfusion if appropriate and not already administered. Has puncture site and possible alternative sites shaved and prepared.

i. Performer may explain or demonstrate use of equipment to a child to allay fears and enlist cooperation; answers questions. Explains that patient will be asked to hold still from time to time. Indicates what will happen, what pain might be experienced, and what cooperation will be needed. Stresses need to maintain positions when ordered.

j. If a Valsalva maneuver is to be used, performer demonstrates and rehearses patient in taking a deep breath, holding breath in, and bearing down as though evacuating until told to relax.

4. Performer makes final decisions on technique and surgical procedures:

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a. Decides on or checks sizes of needles, catheters, guide wires. Decides on type and amount of iodine-based contrast solution, use of automatic injection, use of biplane or single plane serial changer, stereography, magnification, videotape, spot filming, use of pharmacoangiographic agents such as vasodilator and/or vasoconstrictor.

b. If a biplane study is involved, orders desired projections and/or angulation. Indicates whether biplane films will be taken simultaneously or sequentially.

c. Performer decides on program for seriography, and proper elapse of time to provide venograms if appropriate. Informs technologist of the number of films to be taken, the per-second intervals, and the number of series anticipated. Has equipment checked.

d. Has technical factors set for fluoroscopy. As appropriate, orders degree of magnification, angle between tubes for stereoscopy, program for spot filming for units using cassette device.

e. If general anesthesia is to be administered, indicates to anesthesiologist when procedure is to start and allows for appropriate timing.

f. Informs appropriate co-workers of decisions so that patient and materials can be prepared.

5. Performer returns to patient in procedure room when informed that patient and equipment are ready:

a. Checks whether patient has been properly shielded, immobilized, and prepared for sterile puncture procedure. If not acceptable, in-

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dicates the needed adjustments. May decide to immobilize personally.

b. Checks sterile tray prepared for procedure. Requests any missing objects.

   i) Performer checks that appropriate needle and catheter sizes and lengths are available and catheters preformed if appropriate. Checks safety guide wires. May bend catheters personally.
   ii) Checks that syringes with saline and/or anticoagulant solution are prepared, that syringes with contrast medium, vasodilator, vasoconstrictor (if ordered) are ready.
   iii) Checks appearance of contrast medium to be sure there is no chemical deterioration; checks amount.
   iv) May prepare syringe with local anesthetic or checks.

c. If patient has special equipment such as IV or indwelling catheter, performer makes sure that these are being monitored. May check that ECG and/or vital sign monitoring equipment and staff is present. Checks that emergency cart is present.

d. Checks that seriography and/or spot film equipment is ready for use, that technical factors are set for seriography and fluoroscopy, and that equipment for pressure injection is checked and ready for use.

e. Dons protective lead garments and sterile gown and gloves when appropriate. Checks staff shielding.

f. If patient is coherent, performer explains what will be done. Answers patient's questions as appropriate. Reassures patient and does so as deemed needed throughout procedure.

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g. If general anesthesia is to be administered, checks with anesthesiologist to be sure that the patient is ready for procedure to begin.

6. Performer prepares the site(s) for unilateral or bilateral puncture using sterile technique. For each site:

   a. Has patient positioned appropriately for the injection site chosen so as to provide access.

      i) For puncture of femoral artery, positions patient for access below the inguinal ligament as high as possible, but allowing for later compression of the vessel proximal to the puncture site.
      ii) For axillary puncture has patient lie supine with arm abducted and elbow bent, providing access to selected area in the axilla (as peripheral as possible).
      iii) Performer locates the vessel for puncture visually and/or by feeling for arterial pulsation in the location selected. May choose more palpable position in vessel allowing for later compression.

   b. Prepares the site for injection of the local anesthetic and puncture by swabbing with prepared antiseptic solution. Covers surrounding areas with sterile drapes, leaving only small area of injection and puncture uncovered.

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c. Checks amount of local anesthetic to be injected as shown by nurse in syringe, or draws anesthetic into sterile syringe. Checks no air is present. Inserts needle intradermally and subcutaneously; injects. Makes sure to infiltrate the skin and the sheath of the artery on both sides of the vessel. Removes needle. Waits for area to become anesthetized.

d. If performer has decided to use a vasoactive drug, performer times the application of the technique so that the contrast material will be injected during the period of optimal effect.

7. Performer proceeds with selective "Seldinger" catheterization as follows:

   a. If patient is conscious, explains when patient is to hold steady for puncture.

   b. Performer feels for the appropriate arterial pulse by palpating with fingers. Makes an incision or nick through the skin with a sterile scalpel at the site where the needle and catheter will enter.

   c. Performer inserts puncture needle tip (appropriately sized hollow needle with sharp cutting inner stylus or teflon needle tip equipped with stylet and teflon sheath) into the incision while palpating and fixing the artery. Performer angles needle to enter along the lateral side of the vessel with the tip directed along the course of the artery. May attempt to enter only the anterior arterial wall.

   d. Performer pulls out the needle's inner stylus and withdraws the needle slowly until a characteristic "pop" is felt and a vigorous jet of arterial blood is obtained. May pull back on needle, reinsert, or make other incisions until artery is successfully entered.

      i) With teflon needle performer removes stiff inner needle leaving teflon sheath in place.
      ii) May advance needle or sheath several inches into lumen of vessel in the direction of the route to be catheterized.

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   e. Performer inserts a curved tip safety guide wire into the needle or sheath and advances this into the vessel in the direction of the planned route for catheterization. May advance guide wire before removing needle or sheath and introducing catheter.

   f. Once the guide wire is inserted, performer withdraws the hollow needle or sheath, compressing the artery to reduce the bleeding. Cleans blood off guide wire. Inserts the appropriate size catheter by threading catheter over the guide wire and into the artery.

   g. Performer decides whether to advance the catheter using the guide wire as a leader or to remove guide wire. If so decided, removes guide wire.

   h. Performer may check position of catheter at this point:

      i) Performer uses syringe prepared with a small amount of the contrast solution. Checks that medium is appropriate. Connects syringe to the catheter.
      ii) Positions the overhead fluoroscope unit over the patient; may have lights in room dimmed; activates the fluoroscope; adjusts technical factors or has this done.

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iii) Performer has patient hold still. Injects a small amount of the solution into the artery for viewing location of catheter tip and guide wire. iv) Locates site of entry of catheter and checks position of catheter within vessel by viewing on TV monitor. Performer judges whether catheter is correctly inserted in lumen of vessel rather than in an intramural or extravascular position by viewing on TV monitor and watching flow of test dose. v) Adjusts position of guide wire and/or catheter to be sure that the catheter is free to pass along the lumen of the vessel. vi) If performer judges that entry through femoral site chosen cannot be properly accomplished, performer may decide to enter from the opposite artery or alternative axillary route if appropriate. If so, performer repeats appropriate steps for new location after caring for initial site. vii) If entry or placement cannot be easily accomplished, performer may decide to terminate so as to avoid further trauma to vessels. If so, performer records as appropriate and informs staff. May arrange for rescheduling. 8. Performer advances the catheter (with or without guide wire as a leader) under fluoroscopic control, as appropriate, to the abdominal aorta: a. In advancing the catheter and/or guide wire, performer is careful not to force passage. b. If an obstacle is encountered, performer checks position using fluoroscopy, syringe, and small amount	of contrast solution (as described above). Injects a small amount of contrast into the artery through the catheter; activates fluoroscope, and views on the TV monitor. Determines problem and redirects guide wire or catheter as appropriate. Performer evaluates entry route if appropriate and may choose alternative route, decide to reschedule for translumbar aortography, or decides to terminate as described. Performer repeats appropriate steps for any new location after properly caring for initial site. c. With femoral route performer advances guide wire and/or catheter to the aortic bifurcation. Checks by using fluoroscopic control. d. For axillary route performer advances guide wire and/or catheter retrogradely along axillary artery into subclavian artery and thence into descending aorta. Performer may insert curved catheter into aortic arch, direct the curve posteriorly, advance flexible guide wire into descending aorta and then advance catheter. e. Positions catheter in the abdominal aorta if the aorta is to be visualized before selective catheterization of major branches. May check location of catheter using test dose and fluoroscopic control. Performer removes guide wire if not already done. f. For bilateral catheterization (for simultaneous visualization) performer repeats as appropriate on opposite side. If second side approach is not feasible, performer may decide to do sequential catheterization. g. Performer attaches syringe(s) prepared with saline and/or an anti-

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coagulant to catheter(s). Flushes catheter(s) periodically to avoid clotting and to keep catheter clear.

9. If performer is to begin with abdominal aortography, prepares for immediate injection of contrast and filming:

   a. Has patient positioned for supine AP projection of abdomen and pelvis or AP and lateral projections for biplane views. Makes sure proper (close) collimation will be observed and appropriate shielding is in place.
   b. Performer checks that materials are ready for pressure injection of the contrast solution and for serial filming. Checks that patient is properly immobilized, shielded and positioned. Checks coordination of injection with filming:

      i) Checks that the automatic injector (used for introduction of the contrast solution under pressure) is loaded with proper amount of medium in syringe; checks that syringe is attached to injector tubing. Attaches tubing to catheter. Checks that there is no air in the system.
      ii) Performer checks on or orders the rate and pressure setting for the entry force for the automatic injector. Considers the force of entry needed to inject the contrast medium into the vessel of interest given the technique, vessel, and other conditions involved.
      iii) Performer has overhead x-ray tube(s) (single or biplane) positioned for serial filming; checks with the technologist the sequence of injections and sequence of programs (the rate of speed, length of time and intervals selected).

   d. Checks with anesthesiologist (if present) and/or ECG monitor or life support team to determine patient's condition.
   e. Performer directs injection and filming:

      i) Performer may enter control room. Has patient hold steady, if conscious, or awaits indication from anesthesiologist that respiration has been suspended.
      ii) If videotape equipment is to be used, performer activates when judged appropriate.
      iii) Performer tells technologist when to start the automatic film changer(s) (to make sure of proper functioning) to take the series of preprogrammed radiographs. Once changer has started, performer activates the automatic injector.
      iv) Performer has serial aortograms processed at once.

   f. While serial films are being processed, performer examines and talks to patient (if conscious) to evaluate how the patient has responded to the procedure and the injection. Detaches injector tubing; reflushes catheter.
   g. If ECG is being monitored, evaluates any changes during initial injection as possible contraindication for any additional injections.
   h. May decide to provide emergency care at any time throughout procedure if patient shows signs of adverse reactions.

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10. Performer looks at the first set of serial aortograms on view boxes in sequence as soon as they are processed. Places biplane views together.

    a. Checks for technical quality, and notes whether any irregularities are due to artifacts or actual pathological or abnormal conditions, and whether the views are clear enough for medical interpretation. Performer may ask opinion of another radiologist.
    b. Determines whether the aortograms adequately demonstrate the vessel and structures being studied, and provide sufficient information about any pathology, blockage, or distortion of the flow, the extent and location of any anomalies, malformation, the presence of aneurysms, and other signs of abnormal structure or pathology.
    c. Performer considers whether to inject additional contrast, repeat injection and filming with change in technical factors or patient position (such as for oblique view). Considers using alternate route.
    d. Performer may evaluate the details of the aortograms to determine whether selective catheterization such as for study of adrenal, renal, portal venous systems, inferior mesenteric circulation is still necessary or whether sufficient information is provided on the aortograms.
    e. Performer may study the aortogram as a "road map" for use in selectively placing catheter for selective visceral studies.
    f. In deciding whether to repeat examination or proceed with selective catheterization, performer considers the patient's condition, the contraindications, the information already supplied, and the urgency.

       May discuss with anesthesiologist and/or clinician.

       i) For additional puncture sites and catheterization repeats appropriate steps as described above.
       ii) For additional injections, change of position, change in technical factors, performer reviews decisions on injection pressure, amount of contrast, rate and speed of serial programs; indicates what is needed to staff and repeats as appropriate. Allows appropriate elapse of time between injections for patient to respond optimally.
       iii) Repeats relevant steps for repeat or additional aortograms as described above. Repeats review of aortograms as described above until satisfied that the aortograms are technically adequate to demonstrate the areas and conditions under study and to provide sufficient information to make possible a competent medical interpretation.

    g. If selective visceral arteriography is to be done after the abdominal aorta has been entered, performer reinserts guide wire until it reaches the proximal catheter tip. Uses fluoroscopic control. If a straight catheter has been used, may then remove catheter and thread a curved catheter over the guide wire as described. Advances catheter (with guide wire as leader if so decided) into appropriate location as described below:

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11. If performer is to undertake selective abdominal visceral catheterization, may give orders for use of equipment before moving catheter(s) from aorta into selected vessel(s).

    a. If performer decides on use of magnification technique with serial cassette changer(s), such as in study of gastrointestinal bleeding, has technologist adjust height of table and x-ray tube(s) so that the ratio of the focal-film distance (FFD) to the focal-object distance (FOD) (focal spot to film distance divided by focal spot to table distance) is equal to the desired magnification. Has grid removed.
    b. If performer decides on use of spot film equipment with fluoroscopy (such as in adrenal or retroperitoneal arteriography) has technical factors set. If spot film equipment uses cassettes, chooses full, half, or quarter format and sets as appropriate. (If roll film attachment, checks that attachment is loaded with film or has this done.) If performer plans to use magnification technique with spot filming, plans to raise spot film device to appropriate height after positioning and collimating.
    c. If serial filming is to be done, orders program as described above, allowing for venous phase if appropriate.
    d. If biplane filming is to be done, orders projections, angulation and simultaneous or sequential filming as described. For stereo filming using two x-ray tubes, orders the appropriate angulation between tubes.
    e. May have videotape equipment set up for use.
    f. May have vasoactive drugs readied.

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    g. Between individual injections performer may withdraw the catheter from the artery and allow it to lie relaxed in the aorta.
    h. Performer reflushes the catheter(s) periodically with saline and/or anticoagulant. Maintains check on condition of patient. Allows appropriate period of time between injections for reactions to contrast to dissipate.

12. For renal arteriography performer proceeds as follows:

    a. Performer determines from the aortogram how many renal arteries must be opacified to provide the information needed.
    b. Performer may order biplane seriography, video equipment,magnification, as described. May rehearse patient in Valsalva maneuver for use during injection.
    c. Performer may order supine AP,lateral and/or posterior oblique projections.
    d. With patient supine, performer directs the preshaped catheter above the origin of the renal artery to be studied first,using safety guide wire and fluoroscopy control as described.

        i) Performer withdraws the guide wire and pulls back the catheter until the curved tip slips into the renal artery.
        ii) If performer has difficulty, may have the aortic study filmed on video disc run (if video was used). Selects image to use on TV monitor. "Freezes" picture, inverts, and places on TV monitor superimposed over actual image. Then uses displayed picture to assist catheterization.

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e. Performer orders injection force, rate and amount; checks and sets up for filming as described above for aortography. Encourages patient to report any pain during injection as indication that catheter is plugging a vessel. May have patient perform Valsalva maneuver on orders during injection as described above.

f. Performer views the renal arteriograms after each injection to determine whether additional catheterization (bilateral, multiple renal arteries) or positioning is required. Continues until satisfied with diagnostic information.

13. For celiac and/or hepatic arteriography performer proceeds as follows:

a. Performer determines whether to catheterize the celiac axis or to pass the catheter further and enter the hepatic artery.

b. Performer may order serial magnification as described. May order AP and/or lateral projections.

c. Performer directs catheter of appropriate size into the celiac axis using safety guide wire and fluoroscopic control. If so decided, directs the catheter further until it enters the hepatic artery. Withdraws the guide wire.

d. Performer orders the injection and filming programs to include the arterial, capillary hepatic, portal hepatic (venous) phases as appropriate.

e. Explains to patient if hepatic arteriography is to be done, that there will be a sensation of warmth over the area of the liver.

f. Performer may view the celiac arteriograms before deciding on hepatic arteriography. Continues until satisfied with diagnostic information.

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14. For superior mesenteric arteriography performer proceeds as follows:

a. Performer may decide to inject a vasodilator prior to the injection of contrast.

b. Performer may order AP and/or lateral projections.

c. Directs catheter of appropriate size into the superior mesenteric artery using safety guide wire and fluoroscopic control. May make test injection of contrast to check on catheter placement. When satisfied withdraws guide wire.

d. May order a large amount of contrast to produce vasodilation effect to enhance venous information.

e. Performer orders the injection and filming to include the appropriate phases of circulation. Continues until satisfied with diagnostic information.

15. For pancreatic angiography and/or arterial portography performer proceeds as follows:

a. Reviews whether any decision to catheterize the celiac artery and superior mesenteric artery bilaterally and simultaneously is still feasible (whether bilateral catheters have been successfully inserted into abdominal aorta). Does not catheterize celiac artery for portal study if patient has no spleen.

i) For sequential technique performer selects order of catheterization and proceeds as described above (steps 13 and 14) for one artery at a time.

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ii) For simultaneous technique uses the two separate catheters and introduces one into each artery.

b. Performer may decide to use stereoscopic filming and vasoconstrictive drugs. If so, proceeds as described earlier.

c. Performer may order an AP series and/or right posterior oblique views. Selects programs and injection force for arterial, capillary, and venous phases as appropriate. If appropriate, sets up for bilateral, simultaneous injection of contrast.

d. Performer views the angiograms as soon as processed.

   i) For pancreatic study performer decides whether any lesion is adequately demonstrated. Decides whether additional information is needed. If so, decides on use of pharmacoangiography and/or superselective angiography.
   ii) For arterial portography performer decides whether adequate information is available. If not, may decide to order percutaneous splenoportography.

e. If performer decides on pancreatic pharmacoangiography, may use simultaneous technique if both catheters can be inserted. Performer may set up for three film series:

   i) Performer injects a vasoconstrictor into the celiac axis, and then injects both the celiac and superior mesenteric arteries with contrast, and has serial films made as described.
   ii) After five to ten minutes performer injects a vasodilator into the superior mesenteric artery and then injects both the celiac and superior mesenteric arteries with contrast, and has serial films made as described.
   iii) After a proper elapse, performer injects a vasoconstrictor into both arteries; then injects contrast, and has serial films made with lateral views of the arterial phase.

f. If performer decides on superselective pancreatic angiography, performer may sequentially catheterize the hepatic, gastroduodenal and splenic arteries.

   i) May use vasoconstrictive drug.
   ii) May order stereoscopy.

16. For inferior mesenteric arteriography performer proceeds as follows:

   a. Decides whether to place the catheter at the level of the celiac artery to define the celiac, superior and inferior mesenteric orifices simultaneously, or into the inferior mesenteric artery on the left anterior wall of the aorta. Proceeds as decided under fluoroscopic control, using guide wire as leader. Removes wire.
   b. Performer orders automatic injection and serial filming for lateral views. May order left posterior oblique projections.
   c. Performer views the arteriograms and decides whether to take additional views and/or inject a vasodilator prior to reinjection of contrast. If so proceeds as described above.

17. For adrenal angiography performer proceeds as follows:

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a. Performer decides whether to carry out selective renal arteriography to visualize the inferior adrenal branches, selective celiac arteriography for the superior adrenal branches, and/or to carry out selective catheterization of the inferior phrenic and middle adrenal arteries.

b. For selective renal and/or celiac catheterization, may inject a vasoconstrictor prior to injection of contrast. Proceeds as described above (steps 12 and/or 13).

c. For selective inferior phrenic and middle adrenal arteries performer selects appropriate size curved catheter, if different from the one in place, and enters the aorta as described. Uses fluoroscopic control and safety guide wire. Directs catheter down along aortic wall to level of appropriate vessel. Directs the tip of the catheter to enter the selected vessel.

   i) Orders and sets up for automatic injection.
   ii) Performer indicates to patient that there may be a burning sensation in the shoulder or upper flank when contrast is injected.
   iii) Performer may order serial films in AP projection and/or right or left posterior oblique views.
   iv) Performer may collimate fluoroscopic tube to the area of interest and decide to make spot films while viewing on TV monitor. Activates spot film attachment and x-ray foot pedal as appropriate. For magnification raises spot film device before activating exposure control. If cassette attachment, may have technologist remove cassette as spots are snapped and insert additional cassettes, or does so personally.

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d. As soon as injection is completed performer withdraws the catheter tip and permits it to rest freely in aorta.

e. Views angiograms and decides whether to continue as described above.

18. For studies of the retroperitoneal arteries, performer proceeds as follows:

a. Decides which branches to catheterize such as branches leading to suspected tumor vessels, enlarged arteries, or arteries supplying an area of suspected mass. Reviews aortogram.

b. Performer may decide to catheterize both renal arteries, the celiac artery, the inferior phrenic, middle adrenal, gonadal and lumbar in sequence.

   i) Performer carries out catheterization, injection, spot filming and/or seriography for one artery at a time as described.
   ii) Performer may inject and make spot films for one artery at a time.
   iii) Decides whether the source of the problem has been found, whether to use serial filming, whether to continue.
   iv) Performer may use vasoconstrictor before injecting.

19. For studies to diagnose intraluminal and extraluminal abdominal bleeding performer proceeds as follows:

a. Decides, based on prior history, which arteries to catheterize and/or whether to use magnification.

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- i) For upper gastrointestinal bleeding selects celiac and superior mesenteric arteries in sequence.
- ii) For lower GI bleeding selects inferior mesenteric artery.
- iii) For esophageal bleeding related to portal hypertension or mucosal tears selects arterial portography.

b. Makes sure patient is being monitored and any shock symptoms treated.

c. Proceeds with catheterization, injection of contrast, serial filming (with or without magnification) and review of angiograms for arterial, capillary and venous phases, one artery at a time, as described. Decides whether to continue after review.

d. If performer decides that the source of the bleeding has been found, performer may decide to apply a vasoconstrictor under pressure:

- i) If so decided, performer uses the same catheter used for the arteriography.
- ii) Has a vasoconstrictor solution prepared and attached to automatic pressure injector (such as Harvard pump).
- iii) Directs catheter into appropriate artery, such as superior mesenteric artery to decrease portal pressure and control bleeding varices.
- iv) Selects dose, pressure units per minute,and sets. Connects catheter to pressure tubing and checks that there is no air in system. May decide how long to allow solution to flow.
- v) May order periodic repeat of angiography to check on progress of bleeding or repeats after several minutes.

List Elements Fully

- vi) May order check on portal pressure if appropriate.

20. Throughout procedure performer evaluates how the patient is responding. May decide to provide emergency care:

a. Performer determines the severity of the patient's reaction by listening for heartbeat,respiration; may check blood pressure; may take ECG reading, using equipment on emergency cart. May coordinate with team.

b. If patient has a severe reaction to the procedure or contrast medium, such as cardiac arrest, anaphylactic shock (exaggerated negative reaction to the foreign substance), bronchospasm or laryngospasm (stricture of bronchial tubes or larynx), hypotension (drop in blood pressure), cyanosis (bluish discoloration due to excessive concentration of reduced hemoglobin in blood), urticaria (vascular skin reaction), or violent sneezing, performer proceeds at once with emergency life support or measures to control the reaction.

- i) May call anesthesiologist or life support team at once.
- ii) May administer oxygen or air using oxygen tank and mask or ambu bag; may clear airway using finger or tongue blade.
- iii) May decide to establish an airway by removing any dentures and, using a laryngoscope (to view larynx) insert an endotracheal tube.
- iv) May apply closed chest cardiac massage.
- v) Depending on ECG results may apply defibrillator by selecting watt seconds, applying, and

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raising watt seconds until effective.

vi) Depending on ECG results may administer a prepared intracardial injection of a heart stimulant.

vii) May administer IV infusion; may order and administer a corticosteroid, an antihistamine or atropine.

viii) May administer Valium in solution through the injection catheter.

c. Performer decides whether the reaction is sufficiently controlled to proceed.

i) If performer decides to terminate procedure, notifies appropriate medical staff; orders aftercare as appropriate;has patient transported to appropriate location.

ii) Records patient's reactions and what was done on patient's chart. If appropriate, makes sure patient is informed of the type of drug that caused the reaction or explains to patient that he or she is allergic to the contrast solution (i.e. iodine-based solution).

d. If performer judges that patient displays a strong (but not emergency) allergic reaction:

i) Performer may order and administer a corticosteroid, an antihistamine or atropine.

ii) Records reaction and what was done. Explains if appropriate to patient that he or she is allergic to the contrast solution.

List Elements Fully

e. If patient shows signs of going into shock due to internal bleeding, performer has patient monitored and treated for shock at once. May place patient in Trendelenburg position,administer oxygen; may order transfusion; applies selective pressure to restore circulation to vital organs; may apply any emergency care procedures described above. May apply treatment for bleeding as described in step 19, d, above.

f. If performer notes any signs of arterial or venous spasm, may inject an anticoagulant, and/or apply hot packs at once to avoid thrombotic occlusion.

21. Performer decides when the radiographic examination is completed based on information on the angiograms and the patient's condition. Informs anesthesiologist (if present), technologist, and other staff that procedure is to be terminated.

a. Performer returns to the patient. If patient is conscious, performer reassures patient and explains what will happen next.

b. Removes any connecting tubes or syringes from catheter(s).

c. Performer gently and slowly withdraws the catheter(s). Manipulates any catheter by turning and pulling carefully, taking care not to injure the vessel or enlarge the wound at the entry point.

d. Performer compresses the vessel proximal to or at the puncture site with the fingertips and/or sterile gauze for an appropriate amount of time.

i) Does not totally occlude the artery. Checks that there is a

List Elements Fully

pulsation distal to the puncture site and no hematoma at the site.

ii) May have a staff member continue the compression for the time needed. Makes changeover so as to maintain pressure by withdrawing own hands from under those of the relieving staff member once they are in place.

e. Performer applies or orders pressure dressing to be kept in place appropriate amount of time.

f. Performer may order fluids to be given intravenously or by mouth. May order bed rest for appropriate period while patient recovers from effects of procedure.

g. Arranges to have puncture sites, extremities and arterial pulses examined regularly over the next few hours and any problems reported at once. Informs patient or attending staff to report further oozing of blood or swelling.

h. Performer may order careful observation of patient including vital signs, urinary output, and skin care. May order tests, fill out order forms. May order medication.

i. May order delayed urogram appropriate amount of minutes after last injection.

j. Has appropriate sanitary clean up procedures carried out.

k. If requested, calls surgeon or clinician and reports preliminary results and findings.

22. Performer records impressions of procedure on patient's chart:

a. Preliminary findings.
b. How patient tolerated procedure.
c. Any special nursing follow-up recommended, tests, delayed films ordered, records and observation required, medication, later studies ordered.

List Elements Fully

d. May sign chart, requisition sheet or order forms.

TASK DESCRIPTION SHEET

Task Code No. 474

This is page 1 of 10 for this task.

1. What is the output of this task? (Be sure this is broad enough to be repeatable.)

Pt. examined,reassured;decisions made on going ahead, technique,site of puncture,contrast medium,injection, type of filming;preparatory orders given;site anesthetized;aorta punctured;location checked;injection and filming coordinated;aortograms reviewed,and/or procedure continued until final approval;emergency care given;instruments removed;site compressed;orders for after care,tests,urogram,medical impressions recorded.

2. What is used in performing this task? (Note if only certain items must be used. If there is choice, include everything or the kinds of things chosen among.)

X-ray requisition form;pt.'s medical chart,prior films,scans;pen;view boxes;sterile tray with antiseptic,saline,anticoagulant,iodine-based contrast, swabs,tape,scissors,gauze,pressure dressings,local anesthetic,syringes,puncture needles,scalpels,guide wires;automatic injector;table;film changer(s);fluoroscope,TV monitor;emergency cart;sterile gown, gloves;drape;shielding

3. Is there a recipient, respondent or co-worker involved in the task? Yes...(x) No...( )

4. If "Yes" to q. 3: Name the kind of recipient, respondent or co-worker involved, with descriptions to indicate the relevant condition; include the kind with whom the performer is not allowed to deal if relevant to knowledge requirements or legal restrictions.

Any pt.;authorized adult;attending MD;radiologist;anesthesiologist;surgeon;radiologic technologist;nurse

5. Name the task so that the answers to questions 2-4 are reflected. Underline essential words.

Conducting percutaneous translumbar abdominal aortography of any pt. by examining,reassuring pt.;obtaining consent;deciding on technique,site,prior preparation;deciding whether to go ahead,type of injection,filming;injecting local anesthetic;puncturing aorta;advancing needle;testing placement;coordinating pressure injection of contrast and filming;evaluating;ordering additional injections,reviewing arteriograms as appropriate;providing emergency care; removing instruments;ordering after care,tests;delayed films;recording orders,medical impressions.

List Elements Fully

Performer receives the x-ray requisition form and medical chart of a patient scheduled for percutaneous translumbar abdominal aortography (radiographic contrast study of the abdominal aorta, pelvis and lower circulatory system by means of direct needle puncture into aorta) prior to the procedure, such as on the previous day or evening.

1. Performer reads the patient's medical history and requisition form to review the case or to become familiar with materials seen earlier in consultation, in order to make decisions about the conduct of the radiographic study and to check on the request of the referring physician:
   a. Performer notes the patient's age, sex, weight, height, the name of the referring clinician or surgeon. Notes the nature and location of the suspected pathology or symptomology, such as diffuse arterial occlusive disease with atherosclerosis of aorta, illiac arteries, peripheral arterial insufficiency. Notes whether selective aortography by femoral or axillary approach has been considered; notes record on absent or weak femoral pulses.
   b. Performer notes the purpose of the requested

OK-RP;RR;RR

6. Check here if this is a master sheet...(x)

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List Elements Fully

study such as for information for use prior to or after surgery, preliminary or supplementary diagnosis, to evaluate progress of therapy.

c. Notes whether the lower extremities and/or renal arteries are to be investigated.

d. Performer reviews the diagnostic information already obtained, including any prior radiographic studies, radioisotope scans, ultrasonograms, results of clinical tests, lab and sensitivity tests, EKG (ECG) vital signs, clotting time tests.

e. Performer notes relevant prior history such as prior incidents of vascular constriction, definable aortic aneurysm near site of puncture, advanced cardiorenal disease, recent myocardial infarction, history of atherosclerosis, heart disease, hypertension, renal, pulmonary liver disease, thrombosis, anticoagulation therapy, history of allergies or indications of allergy to iodine-based contrast media. Notes stage of female patient's menstrual cycle, any possibility of pregnancy, whether on oral contraceptive. Notes whether patient has an infectious or communicable condition, especially local infection at possible puncture site.

f. Notes whether prior orders have been given to improve patient's clinical condition; if so, notes progress.

g. Performer notes recommendations on use of equipment and technique. Notes recommendations on use of general or local anesthesia.

h. Checks to see whether patient or authorized adult has signed consent for procedure. If not, may decide to obtain personally before sedation is administered.

List Elements Fully

i. Performer may discuss case with referring clinician, specialist, or surgeon to obtain additional information. May arrange for attending physician, anesthesiologist and/or surgeon to accompany performer in examination of patient on day prior to the procedure.

2. Performer visits patient and any authorized adult at bedside or in appropriate location. May be accompanied by clinician, anesthesiologist, surgeon, or appropriate specialist.

a. Performer greets patient and/or authorized adult and explains that a brief examination will occur. If any colleagues are with performer, performer introduces them.

b. Performer reads patient's chart. Notes any new clinical developments, response to care or medication. May ask patient or accompanying adult about symptoms and allergies. Examines the patient for relevant symptoms and general state. Reassures and answers questions. If not already done, performer determines whether there is any possibility of pregnancy in the case of a female patient, whether patient has been taken off any oral contraceptive. Notes blood pressure. Examines lumbar area to check for possible local infection.

c. Performer considers whether there have been changes in the patient's condition since the decision was made to do the procedure, and considers whether there are contraindications to going ahead with the procedure. May confer with

TASK DESCRIPTION SHEET (continued)

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specialist, clinician, or surgeon; discusses patient's current condition. Decides whether to proceed, cancel or delay procedure based on assessment of patient's current condition and any discussion.

d. If performer decides not to have procedure done, may discuss with clinician. Records on chart any reasons for cancellation and any recommendations for alternative procedure, such as catheter aortography or selective visceral arteriography.

e. Performer may decide to delay procedure, have patient undergo treatment to improve clinical condition, such as treatment for blood pressure, anemia, infectious condition, or malnutrition. Discusses as appropriate and has orders given for care of patient. If patient has been on anticoagulant therapy, may order cessation until prothrombin and/or clotting times are within normal levels. May order cessation of oral contraceptive if not already done. With emergency patient may determine whether delay is contraindicated.

f. If performer decides to proceed and a consent for the procedure has not been obtained, performer may explain to the patient or guardian in comprehensible language what will occur in the procedure, its purpose, and the dangers to the patient involved. Performer explains the alternatives; answers questions.

   i) When the performer is sure that the patient understands the risks, asks the patient for signature on consent form and checks that it is properly signed.
   ii) If a guardian is to sign, performer explains to the individual as appropriate.
   iii) If a consent is not agreed to, performer postpones procedure until it is obtained. May discuss with appropriate physician or individuals and/or with patient. Does not proceed unless consent is obtained.

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g. Performer decides on puncture site. Orders the type of equipment to use based on institutional facilities, nature of the study and purpose:

   i) May order conventional equipment or use of large film angiographic serial changer, unit with push rod and wedge filter; orders single or biplane unit, fluoroscopic capabilities for monitoring.
   ii) Orders hand or automatic pressure injection, types and sizes of puncture needles. Selects appropriate contrast solution and amount.

h. Performer may make preliminary decisions on care of patient:

   i) Decides on use of general and/or local anesthetic. May discuss with anesthesiologist. If a general anesthetic is to be administered, performer arranges to have staff ready at the appropriate time.
   ii) Performer makes final decisions on prior preparation of the patient such as sedation, period for withholding of food, hydration, prior IV drip, cleansing enema, shaving of entry site, prior administration of antihistamine, medications to deal with problems of blood clotting.

i. Performer records orders as appropriate so that patient and equip-

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List Elements Fully	List Elements Fully

ment can be prepared and staff assigned. May sign requisition; places for scheduling.

j. Reviews with patient the procedures that will occur.

3. Just prior to the time for which the procedure is scheduled, the performer reviews all the relevant medical information and the patient's chart. Reviews relevant prior radiographs. Notes any new developments.

   a. Performer greets patient in examination room. May question about symptoms; reassures and explains what will occur.
   b. Performer checks that all prior preparatory procedures have been carried out.

      i) Checks report on electrolyte levels, blood clotting time, vital signs.
      ii) Checks that any orders for hydration,starting of IV infusion, cleansing, prior administration of medication and/or sedation have been carried out, and at appropriate time. If not, arranges to have these done and/or procedure delayed.

   c. Performer examines puncture site to review earlier decision. Makes sure no swelling or tenderness is present.
   d. Performer orders scout film(s) of the abdomen with patient in the prone,PA position as appropriate for single or biplane views. May order lower extremities included. Makes sure proper shielding is being used.

      i) Performer places the processed scout films on view boxes and examines as soon as they are ready. Performer considers whether the areas of interest are visible, whether the technique is satisfactory, and whether the position(s) of the patient are correct.
      ii) If the scouts are not satisfactory, performer indicates the needed changes in technique or in the patient's position to the radiologic technologist.
      iii) Performer considers whether any unsuspected aneurysm may be present at or near the puncture site. Notes any possible impediments to successful entry into aorta such as variations in structure. Makes final decision on site of puncture. If possible, selects a suprarenal site.
      iv) Performer considers whether any barium traces from earlier examination or contents of gastrointestinal tract must be cleared. May order further cleansing or delay in procedure.

   e. Performer considers whether patient's current condition presents any contraindications to going ahead with the procedure. May have clinician or specialist called; discusses patient's condition and any alternative steps. Decides whether to proceed or not based on need, evaluation of patient's condition and contraindications.
   f. If performer decides not to proceed, records reasons and any recommendations on patient's chart. Informs appropriate co-workers of cancellation and has patient returned to room. If appropriate, orders rescheduling of patient

List Elements Fully	List Elements Fully
or scheduling for alternative procedure. g. If patient is pediatric patient or if general anesthesia has been suggested for adult, performer may reconsider whether general anesthesia is still warranted; may decide to order if patient's behavior and condition suggest the need. If general anesthesia is to be carried out, performer discusses with anesthesiologist when it is to be administered and plans to coordinate with anesthesiologist. h. May order sedation, tranquilizer, and/or IV drip if appropriate and not already administered. Has puncture site prepared. i. Performer may explain or demonstrate use of equipment to a child to allay fears and enlist cooperation; answers questions. Explains that patient will be asked to hold still from time to time. Indicates what will happen, what pain might be experienced, and what cooperation will be needed. Stresses need to maintain positions when ordered. 4. Performer makes final decisions on technique and surgical procedure: a. Decides on or checks sizes of needles, guide wires, type and amount of contrast material, use of automatic or hand injection, use of biplane or single plane serial changer. b. If a biplane study is involved, orders AP and lateral projections or indicates desired angulation. Indicates whether biplane films will be taken simultaneously or sequentially. c. Performer may decide on program for seriography, and proper elapse of time to provide venograms if appropriate. Informs technologist of the	number of films to be taken, the per-second intervals, and the number of series anticipated. Has equipment checked. d. Has technical factors set for fluoroscopy. e. If general anesthesia is to be administered, indicates to anesthesiologist when procedure is to start and allows for appropriate timing. May wait while anesthesiologist administers epidural block. f. Informs appropriate co-workers of decisions so that patient and materials can be prepared. 5. Performer returns to patient in procedure room when informed that patient and equipment are ready: a. Checks whether patient has been properly shielded, immobilized and prepared for sterile puncture procedure. If not acceptable, indicates the needed adjustments. May decide to immobilize personally. b. Checks sterile tray prepared for procedure. Requests any missing objects. i) Performer checks that appropriate needle and guide wire sizes are available. ii) Performer may prepare or check percutaneous needle to be used. iii) Checks that syringes with saline and/or anticoagulant solution are prepared, that syringes with contrast medium are ready. iv) Checks appearance of contrast medium to be sure there is no chemical deterioration; checks amount. v) May prepare syringe with local anesthetic or checks.

List Elements Fully

c. If patient has special equipment such as IV or indwelling catheter, performer makes sure that these are being monitored. May check that ECG monitoring equipment is present. Checks that emergency cart is present.

d. Checks that seriography equipment (if ordered) is ready for use, that technical factors are set for seriography and fluoroscopy, and that equipment for hand or pressure injection is checked and ready for use.

e. Dons protective lead garments and sterile gown and gloves when appropriate. Checks staff shielding.

f. If patient is coherent, performer explains what will be done. Answers patient's questions as appropriate. Reassures patient and does so as deemed needed throughout procedure.

g. If general anesthesia is to be administered, checks with anesthesiologist to be sure that the patient is ready for procedure to begin.

6. Performer proceeds to prepare the puncture site using sterile technique:

a. Has patient positioned in prone position with feet everted and lumbar area at the site selected (left twelfth rib unless contraindicated) exposed.

b. Unless already done, prepares the site by swabbing with prepared antiseptic solution. Covers surrounding areas with sterile drapes, leaving only small area for injection and puncture uncovered.

c. Unless patient has been anesthetized, checks amount of local anesthetic to be injected as shown by nurse in syringe, or draws anesthetic into sterile syringe. Checks that there is no air and inserts needle about four to five cm. intradermally and subcutaneously, directed along the projected path of the puncture needle. Removes needle. Waits for area to become anesthetized.

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d. Performer palpates the twelfth left rib for optimal entry or as appropriate for the site selected. Finds a point 9-10 cms. to the left of the midline, about 10 cm. under the rib.

e. May make an incision or nick through the skin with a sterile scalpel at the site where the needle will enter.

f. If patient is conscious, explains when patient is to hold steady for puncture.

g. Performer inserts the appropriate size teflon needle tip (equipped with stylet and teflon sheath) into the incision and directs it anteriorly and medially at an approximate 45° angle. If the upper abdominal aorta is to be visualized, directs needle parallel to the twelfth rib; for lower abdominal aorta, pelvic and lower extremity arteries, directs needle at right angles to spine.

h. Has patient hold breath. Attempts to reach the aorta. Checks for the characteristic pulsation of the aorta felt through the needle. Penetrates aorta with a short, controlled stab.

i. If the performer finds that the needle tip hits a transverse process or the body of a lumbar vertebra, performer partially withdraws needle and redirects it as appropriate.

j. Performer checks entry into the aorta by removing the inner stylet and withdrawing needle until a pulsing flow of blood is ob-

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tained. May pull back on needle, reinsert, or make other incisions until aorta is successfully entered.

k. Removes stiff inner needle leaving teflon sheath in place. May advance sheath several inches into the vessel in the direction of the area of interest. May use guide wire as leader. Has patient avoid moving as much as possible.
l. Performer may attach syringe prepared with saline and/or anticoagulant to teflon sheath. Flushes periodically to avoid clotting. May make further check by noting any resistence to injection of saline solution, and pulsation of blood.

7. Performer may use overhead filming or fluoroscopy to check placement of the teflon sheath in the aorta. Has a syringe prepared with a small amount of the contrast solution. Checks that medium is appropriate. Connects syringe to the teflon sheath.

   a. Performer may position overhead x-ray tube to take view that will show depth of entry into aorta or positions fluoroscope unit over patient and activates.
   b. Performer has patient hold still. Injects a small amount of the contrast solution for viewing location.

      i) If performer has technologist take radiograph, views radiograph on view box when it is brought or goes to automatic processor.
      ii) If performer uses fluoroscopy, views position of sheath on TV monitor.

   c. Performer judges whether sheath is correctly inserted in the aorta in the proper direction rather than in an intramural or extramural position by viewing on TV monitor and watching flow or image of test dose. Evaluates whether there is any possible flooding of a single aortic branch vessel. Readjusts or reinserts sheath, checking on fluoroscope monitor or with overhead film until this is accomplished.
   d. Performer may advance the sheath up or downstream, depending on the area of interest. Reflushes site.
   e. If performer has ordered overhead(s) may decide whether the radiograph(s) obtained provide sufficient information to terminate procedure. If so, proceeds to terminate as described below.

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8. Performer prepares for immediate injection of contrast and filming:

   a. Has patient maintained in prone, face down position. May have feet everted (rotated internally). May have toes raised off table and supported. For lower extremity study may order successive positioning of films for abdominal aorta, pelvis, thigh and distal runoff vessels unless large size films are being used.
   b. Makes sure proper collimation will be observed and appropriate shielding is in place.
   c. If pressure injection is to be done by hand, performer prepares or checks syringe with the iodine based, aqueous contrast solution for correct quantity, depending on vessels to be opacified. Attaches to teflon sheath and makes sure there is no air in system.
   d. If pressure injection is to be done by automatic injector, performer prepares to coordinate injections with filming:

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- i) Checks that the automatic injector (used for introduction of the contrast solution under pressure) is loaded with proper amount of medium in syringe; checks that syringe is attached to injector tubing. Attaches tubing to teflon sheath. Checks that there is no air in system.
- ii) Performer checks on or orders the rate and pressure setting for the entry force for the automatic injector. Considers the force of entry needed to inject the contrast medium into the vessel of interest given the technique, vessel, and other conditions involved.

e. Performer has overhead x-ray tube(s) (single or biplane) positioned for serial or conventional filming; checks with the technologist the rate of speed and length of time selected. Checks rate in relation to the series of injections of the contrast solution and any need for filming of venous return.

f. Performer directs injection and filming:

- i) Performer may enter control room. Has patient hold steady if conscious or awaits indication from anesthesiologist that respiration has been suspended.
- ii) If performer injects the contrast solution by hand, does so in predetermined amounts spaced periodically as decided; tells technologist when to activate the automatic film changer or exposure control. Adjusts filming and injection timing to provide for venograms as appropriate.
- iii) For automatic injection, tells technologist when to start the automatic film changer(s) (to make sure of proper functioning) to take the series of preprogrammed radiographs or when to make exposure. Once changer has started, performer activates the automatic injector.

g. Performer has aortograms processed at once.

9. While aortograms are being processed, performer examines and talks to patient (if conscious) to evaluate how the patient has responded to the procedure and the injection.

   a. Detaches injector tubing; reflushes puncture site.
   b. If ECG is being monitored, evaluates any changes during initial injection as possible contraindication for additional injections.
   c. May decide to provide emergency care at any time throughout procedure if patient shows signs of adverse reactions.

10. Performer looks at the first set of aortograms on view boxes in sequence as soon as they are processed. Places frontal and lateral views together.

   a. Checks for technical quality and notes whether any irregularities are due to artifacts or actual pathological or abnormal conditions, and whether the views are clear enough for medical interpretation. Performer may ask opinion of another radiologist.
   b. Determines whether the aortograms adequately demonstrate the vessels and structures being studied and provide sufficient information about any pathology, blockage, or distortion of the flow, the extent and location of any arteriovenous malfunction, the presence

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of aneurysms, and other signs of abnormal structure or pathology.

c. Performer considers whether to inject additional contrast and continue filming, repeat injection and filming with change in technical factors or patient position. Considers additional or alternative approaches. Considers the patient's condition, the contraindications, the information already supplied and urgency. May discuss with anesthesiologist and/or clinician.

d. For additional injections, change of position, change in technical factors, performer reviews decisions on injection pressure, amount of contrast, rate and speed of serial programs; indicates what is needed to staff and repeats as appropriate. Allows appropriate elapse of time between injections for patient to respond optimally. Reflushes site.

e. Repeats relevant steps for repeat or additional views and locations as described above.

f. Repeats review of radiographs as described above until satisfied that the angiograms are technically adequate to demonstrate the areas and conditions under study and to provide sufficient information to make possible a competent medical interpretation.

11. Throughout procedure performer evaluates how the patient is responding. May decide to provide emergency care:

a. Performer determines the severity of the patient's reaction by listening for heartbeat, respiration; may check blood pressure; may take ECG reading, using equipment on emergency cart.

b. If patient has a severe reaction to the procedure or contrast medium,

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such as cardiac arrest, anaphylactic shock (exaggerated negative reaction to the foreign substance), bronchospasm or laryngospasm (stricture of bronchial tubes or larynx), hypotension (drop in blood pressure), cyanosis (bluish discoloration due to excessive concentration of reduced hemoglobin in blood), urticaria (vascular skin reaction), or violent sneezing, performer proceeds at once with emergency life support or measures to control the reaction.

i) May call anesthesiologist or life support team at once.

ii) May administer oxygen or air using oxygen tank and mask or ambu bag; may clear airway using finger or tongue blade.

iii) May decide to establish an airway by removing any dentures and, using a laryngoscope (to view larynx) insert an endotracheal tube.

iv) May apply closed chest cardiac massage.

v) Depending on EKG results may apply defibrillator by selecting watt seconds, applying, and raising watt seconds until effective.

vi) Depending on EKG results may administer a prepared intracardial injection of a heart stimulant.

vii) May administer IV infusion;may order and administer a corticosteroid, an antihistamine or atropine.

viii) May administer Valium in solution through the injection catheter.

c. Performer decides whether the reaction is sufficiently controlled to proceed.

TASK DESCRIPTION SHEET (continued)

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- i) If performer decides to terminate procedure, notifies appropriate medical staff; orders aftercare as appropriate; has patient transported to appropriate location.
- ii) Records patient's reactions and what was done on patient's chart. If appropriate, makes sure patient is informed of the type of drug that caused the reaction or explains to patient that he or she is allergic to the contrast solution (i.e. iodine-based solution).

d. If performer judges that patient displays a strong (but not emergency) allergic reaction:

- i) Performer may order and administer a corticosteroid, an antihistamine or atropine.
- ii) Records reaction and what was done. Explains if appropriate to patient that he or she is allergic to the contrast solution.

12. Performer decides when the radiographic examination is completed based on information on the angiograms and the patient's condition. Informs anesthesiologist (if present), technologist and other staff that procedure is to be terminated.

a. Performer returns to the patient. If patient is conscious, performer reassures patient and explains what will happen next.
b. Removes any connecting tubes or syringes from teflon sheath.
c. Performer gently and slowly withdraws the sheath. Manipulates by turning and pulling carefully, taking care not to injure the vessel or enlarge the wound at the entry site.

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d. Performer applies compression at the puncture site with the fingertips and/or sterile gauze for an appropriate amount of time.
e. Performer applies or orders pressure dressing to be kept in place appropriate amount of time.
f. Performer may order fluids to be given intravenously or by mouth. May order bed rest for appropriate period while patient recovers from effects of procedure.
g. Arranges to have puncture site and arterial pulses examined regularly over the next few hours and any problems reported at once. Informs patient or attending staff to report further oozing of blood or swelling.
h. Performer may order careful observation of patient including vital signs, urinary output, and skin care. May order tests, fill out order forms. May order medication.
i. May order delayed urogram appropriate amount of minutes after last injection.
j. Has appropriate sanitary clean up procedures carried out.
k. If requested, calls surgeon or clinician and reports preliminary results and findings.

13. Performer records impressions of procedure on patient's chart:

a. Preliminary findings.
b. How patient tolerated procedure.
c. Any special nursing follow-up recommended, tests, delayed films ordered, records and observation required, medication, later studies ordered.
d. May sign chart, requisition sheet or order forms.

TASK DESCRIPTION SHEET

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This is page 1 of 10 for this task.

1. **What is the output of this task?** (Be sure this is broad enough to be repeatable.)

Pt. examined, reassured; decisions made on going ahead, technique, site of puncture, contrast medium, injection, type of filming; preparatory orders given; site anesthetized; spleen punctured; location checked; injection and filming coordinated; splenoportograms reviewed, and/or procedure continued until final approval; emergency care given; instruments removed; site compressed; orders for after care, tests, delayed film, medical impressions recorded.

2. **What is used in performing this task?** (Note if **only** certain items must be used. If there is choice, include everything or the kinds of things chosen among.)

X-ray requisition form; pt.'s medical chart, prior films; pen; view boxes; sterile tray with antiseptic, saline, iodine-based contrast, swabs, tape, scissors, gauze, pressure dressings; local anesthetic, syringes, puncture needles, scalpels; manometer, table; film changer; fluoroscope, TV monitor; emergency cart; sterile gown, gloves drape; shielding

3. Is there a recipient, respondent or co-worker involved in the task? Yes...(✓) No...( )

4. **If "Yes" to q. 3:** Name the **kind** of recipient, respondent or co-worker involved, with descriptions to indicate the relevant condition; include the kind with whom the performer is not allowed to deal if relevant to knowledge requirements or legal restrictions.

Any pt.; authorized adult; attending MD; radiologist; anesthesiologist; surgeon; radiologic technologist; nurse

5. **Name the task** so that the answers to questions 1-4 are reflected. Underline essential words.

Conducting percutaneous splenoportography of any pt. by examining, reassuring pt.; obtaining consent; deciding whether to go ahead, prior preparation, site of entry; injecting anesthetic; inserting teflon puncture needle into spleen using fluoroscopy; checking entry; injecting iodine-based contrast solution and ordering serial filming; deciding whether to continue, deciding when examination is completed by viewing splenoportograms; providing emergency care; removing instruments; ordering after care, tests, delayed films; recording orders, medical impressions.

List Elements Fully

Performer receives the x-ray requisition form and medical chart of a patient scheduled for splenoportography (radiographic contrast study of the spleen and the splenic, portal and hepatic veins after injection of contrast into the body of the spleen by direct percutaneous procedure) prior to the procedure, such as on the previous day or evening.

1. Performer reads the patient's medical history and requisition form to review the case or to become familiar with materials seen earlier in consultation, in order to make decisions about the conduct of the radiographic study and to check on the request of the referring physician:
   a. Performer notes the patient's age, sex, weight, height, the name of the referring clinician or surgeon. Notes the purpose of the requested study such as for information for use prior to or after surgery, preliminary or supplementary diagnosis.
   b. Notes the nature and location of the suspected pathology or symptomology, such as splenic disease, enlargement, occlusion of veins of the splenoportal system, effects of portal hypertension, abnormal structures of the portal

OK-RP; RR; RR

6. Check here if this is a master sheet..(✓)

TASK DESCRIPTION SHEET (continued)

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system. Notes whether splenic pressure is to be recorded.

c. Performer reviews the diagnostic information already obtained, including any prior radiographic studies such as arterial portography, selective celiac angiography, results of clinical tests, lab and sensitivity tests, EKG, vital signs, clotting time tests. Reviews any current radiographs to become familiar with evidence on the location of the pathological condition and to check whether there is any danger of puncturing an aneurysm or an arterial branch near the splenic hilum (where the vessels and nerves enter).

d. Performer notes relevant prior history such as history of infective splenomegaly, abnormal bleeding tendency, anticoagulation therapy, history of allergies or indications of allergy to iodine-based contrast media. Notes stage of female patient's menstrual cycle, any possibility of pregnancy, whether on oral contraceptive. Notes whether patient has local infection at puncture site.

e. Notes whether prior orders have been given to improve patient's blood clotting or clinical condition; if so, notes progress.

f. Performer notes recommendations on use of equipment and technique. Notes recommendations on use of general or local anesthesia.

g. Checks to see whether patient or authorized adult has signed consent for procedure. If not, may decide to obtain before sedation is given.

h. Performer may discuss case with referring clinician, specialist, or surgeon to obtain additional information. May arrange for attending physician, anesthesiologist and/or surgeon to accompany

List Elements Fully

performer in examination of patient on day prior to the procedure.

2. Performer visits patient and any authorized adult at bedside or in appropriate location. May be accompanied by clinician, anesthesiologist, surgeon, or appropriate specialist.

a. Performer greets patient and/or authorized adult and explains that a brief examination will occur. If any colleagues are with performer, performer introduces them.

b. Performer reads patient's chart. Notes any new clinical developments, response to care or medication. May ask patient or accompanying adult about symptoms and allergies. Examines the patient for relevant symptoms and general state. Reassures and answers questions. If not already done, performer determines whether there is any possibility of pregnancy in the case of a female patient, whether patient has been taken off any oral contraceptive. Notes blood pressure. Examines abdominal area; palpates and checks for local infection.

c. Performer considers whether there have been changes in the patient's condition since the decision was made to do the procedure, and considers whether there are contraindications to going ahead with the procedure. May confer with specialist, clinician, or surgeon; discusses patient's current condition. Decides whether to proceed, cancel or delay procedure based on assessment of patient's current condition and any discussion.

TASK DESCRIPTION SHEET (continued)

Task Code No. 475

This is page 3 of 10 for this task.

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d. If performer decides not to have procedure done, may discuss with clinician. Records on chart any reasons for cancellation and any recommendations for alternative procedure. Informs staff of cancellation and discusses with patient.

e. Performer may decide to delay procedure, have patient undergo treatment to improve clinical condition, such as treatment for blood pressure, anemia, infectious condition, malnutrition, inadequate clotting power. Discusses as appropriate and has orders given for care of patient. If patient has been on anticoagulant therapy, may order cessation until prothrombin and/or clotting times are within normal levels. May order cessation of oral contraceptive if not already done. With emergency patient may determine whether delay is contraindicated.

f. If performer decides to proceed and a consent for the procedure has not been obtained, performer may explain to the patient or guardian in comprehensible language what will occur in the procedure, its purpose, and the dangers to the patient involved. Performer explains the alternatives; answers questions.

   i) When the performer is sure that the patient understands the risks, asks the patient for signature on consent form and checks that it is properly signed.
   ii) If a guardian is to sign, performer explains to the individual as appropriate.
   iii) If a consent is not agreed to, performer postpones procedure until it is obtained. May discuss with appropriate physician or individuals and/or with patient. Does not proceed unless consent is obtained.

List Elements Fully

g. Performer decides on the type of equipment to use based on institutional facilities and purpose of study:

   i) Orders serial cassette changer, equipment for manual injection of contrast, type and size of puncture needle.
   ii) Selects appropriate contrast solution and amount.

h. Performer may make preliminary decisions on care of patient:

   i) Decides on use of general and/or local anesthetic. May discuss with anesthesiologist. If a general anesthetic is to be administered, performer arranges to have staff ready at the appropriate time.
   ii) Performer makes final decisions on prior preparation of the patient such as sedation, period for withholding of food, hydration, prior IV drip, cleansing enemas, prior administration of antihistamine, medications to deal with problems of blood clotting, such as transfusion, vitamin K therapy. May order EKG (ECG) monitoring.

i. Performer records orders as appropriate so that patient and equipment can be prepared and staff assigned. May sign requisition; places for scheduling.

j. Reviews with patient the procedures that will occur.

3. Just prior to the time for which the procedure is scheduled, the performer reviews all the relevant medical information and the patient's chart. Reviews relevant prior radiographs. Notes any new developments.

TASK DESCRIPTION SHEET (continued)

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a. Performer greets patient in examination room. May question about symptoms; reassures and explains what will occur.

b. Performer checks that all prior preparatory procedures have been carried out.

   i) Checks report on electrolyte levels, blood clotting time, vital signs.

   ii) Checks that any orders for cleansing, hydration, starting of IV infusion or transfusion, prior administration of medication and/or sedation have been carried out, and at appropriate time. If not, arranges to have these done and/or procedure delayed.

   iii) Performer examines abdominal area.

c. Performer orders a supine AP and lateral scout film(s) of the abdomen for the respiratory phase that will be used for all filming (suspended inspiration or expiration) and for the puncture. Makes sure proper shielding is being used.

   i) Performer places the processed scout film(s) on view boxes and examines as soon as they are ready. Performer considers whether the areas of interest are visible, whether the technique is satisfactory, and whether the position of the patient is correct.

   ii) If the scout(s) are not satisfactory, performer indicates the needed changes in technique or in the patient's position to the radiologic technologist.

   iii) Performer considers whether contents of gastrointestinal tract must be cleared. May order further cleansing or delay in procedure.

List Elements Fully

   iv) Performer considers whether any unsuspected aneurysm may be present at or near the puncture site.

   v) Performer considers the size, condition and position of the spleen as visualized and decides on the puncture site (in an intercostal space on the midaxillary line) and the depth to which the needle is to be inserted. Attempts entry where the spleen is close to the abdominal wall. Performer may have patient suspend respiration at the appropriate phase; places a lead marker on the patient's skin at a point marking the position of the spleen in the respiratory phase chosen (for use in centering).

d. Performer considers whether the patient's current condition presents any contraindications to going ahead with the procedure. May have clinician or specialist called; discusses patient's condition and any alternative steps. Decides whether to proceed or not based on need, evaluation of patient's condition and contraindications.

e. If performer decides not to proceed, records reasons and any recommendations on patient's chart. Informs appropriate co-worker of cancellation and has patient returned to room. If appropriate, orders rescheduling of patient or scheduling for alternative procedure.

f. If patient is pediatric patient or if general anesthesia has been suggested for adult, performer may reconsider whether general anesthesia is still warranted; may decide to order if patient's behav-

TASK DESCRIPTION SHEET (continued)

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ior and condition suggest the need. If general anesthesia is to be carried out, performer discusses with anesthesiologist when it is to be administered and plans to coordinate with anesthesiologist.

g. May order sedation and/or IV drip or transfusion if appropriate and if not already administered. Has puncture site prepared.

h. Performer may explain or demonstrate use of equipment to a child to allay fears and enlist cooperation; answers questions. Explains that patient will be asked to hold breath again from time to time as already done. Indicates what will happen. Explains that patient will feel a sensation of warmth or burning during injection. Encourages patient to report any pain felt during injection (as sign of extrasplenic deposition of contrast).

i. Performer makes final decisions on equipment and technique:

   i) Decides on size of needle, type and amount of contrast solution.
   ii) Performer decides on program for seriography. Informs technologist of the number of films to be taken, the per-second intervals, and the number of series anticipated. Has equipment checked.
   iii) Has technical factors set for fluoroscopy if appropriate.
   iv) If general anesthesia is to be administered, indicates to anesthesiologist when procedure is to start and allows for appropriate timing.
   v) Informs appropriate co-workers of decisions so that patient and materials can be prepared.

4. Performer returns to patient in procedure room when informed that patient and equipment are ready:

List Elements Fully

a. Checks whether patient has been properly positioned, shielded, immobilized and prepared for sterile puncture procedure. If not acceptable, indicates the needed adjustments. May decide to immobilize personally.

b. Checks sterile tray prepared for procedure. Requests any missing objects.

   i) Performer checks that appropriate teflon needles are available. May prepare or check percutaneous needle to be used.
   ii) Checks that syringes with saline solution are prepared and syringes with contrast medium are ready.
   iii) Checks appearance of contrast medium to be sure there is no chemical deterioration; checks amount.
   iv) May prepare syringe with local anesthetic or checks.

c. If patient has special equipment such as IV or indwelling catheter, performer makes sure that these are being monitored. May check that ECG monitoring equipment is present. Checks that emergency cart is present.

d. Checks that seriography equipment is ready for use, that technical factors are set for seriography and fluoroscopy.

e. Dons protective lead garments and sterile gown and gloves when appropriate. Checks staff shielding.

f. If patient is coherent, performer explains what will be done. Answers patient's questions as appropriate. Reassures patient and does so as deemed needed throughout procedure.

g. If general anesthesia is to be administered, checks with anesthesi-

List Elements Fully

ologist to be sure that the patient is ready for procedure to begin.

5. Performer proceeds to prepare the puncture site using sterile technique:
    a. With patient in supine position, with left arm abducted, performer locates the site selected in the mid-axillary line at the appropriate intercostal space where spleen is closest to the abdominal wall.
    b. Unless already done, performer prepares the site for injection of the local anesthetic and puncture by swabbing with prepared antiseptic solution. Covers surrounding areas with sterile drapes, leaving only small area for injection and puncture uncovered.
    c. Unless patient has been anesthetized, checks amount of local anesthetic to be injected as shown by nurse in syringe, or draws anesthetic into sterile syringe. Checks that there is no air in syringe and inserts needle intradermally and subcutaneously along the projected path of the puncture needle (somewhat cranially in the frontal plane). Injects anesthetic; removes needle. Waits for area to become anesthetized.

6. Performer proceeds with puncture:
    a. Performer positions overhead fluoroscope unit over patient; may have lights in room dimmed. Activates fluoroscope or has this done by technologist. Performer adjusts unit until the spleen is visible on the TV monitor. May indicate needed adjustment in technical factors to technologist. May reposition patient.
    b. Performer selects the exact point of entry so that the tip of the

List Elements Fully

puncture needle will enter near the hilum of the spleen. May cut a tiny nick in skin at site with sterile scalpel.
    c. Performer positions appropriate size puncture needle (equipped with stylet and teflon sheath) over the entry site (or nick). May view location of needle on the TV monitor. Adjusts needle to the proper angle for entry. (May use sponge stick or towel clip to avoid placing hands directly in path of radiation beam.)
    d. Asks patient to suspend respiration as rehearsed or awaits signal from anesthesiologist.
    e. Inserts puncture needle quickly, so as to pass through abdominal wall into spleen, entering near the hilum and avoiding neighboring organs, to the appropriate depth. Unless there are splenic adhesions, performer feels for the characteristic sensation as tip of needle "scrapes" the rough surface of the spleen.
    f. Performer removes the stiff inner stylet of needle leaving the teflon sheath in place.
        i) May attach syringe with saline and clear needle by flushing with saline.
        ii) Removes saline syringe and attaches empty syringe. Allows patient to breathe shallowly but normally.
    g. Checks for appropriate placement by noting whether there is a free flow of blood through the sheath.
        i) If performer observes no blood, performer pulls back teflon sheath one-to-two mm.'s and repeats.

TASK DESCRIPTION SHEET (continued)

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ii) Performer may test entry using contrast medium. Attaches a syringe containing contrast medium to the sheath. Injects a small test amount of the contrast medium into the spleen through the sheath. Checks on the TV monitor to be sure that the sheath is lying near the hilum. Notes whether the contrast medium outlines the venous structures fed by the spleen. Removes syringe; wipes off blood.

iii) If performer decides that proper entry has not been accomplished, repeats procedure as appropriate until satisfied. May select another entry site and repeat until sure of proper entry.

h. Once performer has decided that proper entry has been accomplished, performer may advance sheath into the spleen. Makes sure free end of sheath is not restricted from following respiratory motion of patient.

i. If there is request to obtain splenic pressure,performer attaches manometer to the teflon sheath; reads and records splenic pressure. Removes manometer.

7. Performer prepares for immediate injection of contrast and filming:

   a. Has patient maintained in supine AP position. Makes sure proper (close) collimation will be observed and appropriate shielding is in place.
   b. Prepares or checks syringe with the iodine-based, aqueous contrast solution for correct quantity and attaches to teflon sheath. Checks that there is no air in system.
   c. Performer has overhead x-ray tube positioned for serial filming; checks with the technologist the rate of speed and length of time selected.
   d. Checks with anesthesiologist (if present) and/or ECG monitor to determine patient's condition or reminds patient to suspend respiration,when ordered,without straining.
   e. Performer directs injection and filming:

      i) Performer has patient hold breath, if conscious, or awaits indication from anesthesiologist that respiration has been suspended.
      ii) Performer tells technologist when to start the automatic film changer (to make sure of proper functioning) to take the series of preprogrammed radiographs.
      iii) Performer injects contrast medium using appropriate pressure on syringe as determined and coordinating with automatic changer.

   f. Performer has splenoportograms processed at once.
   g. While serial films are being processed, performer examines and talks to patient (if conscious) to evaluate how the patient has responded to the procedure and the injection. Detaches contrast syringe from sheath. May reflush with saline.
   h. If ECG is being monitored, evaluates any changes during initial injection as possible contraindication for any additional injections.
   i. May decide to provide emergency care at any time throughout procedure if patient shows signs of adverse reactions.

TASK DESCRIPTION SHEET (continued)

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8. Performer looks at splenoportograms in order, on view boxes as they are processed:

   a. Checks for technical quality, and notes whether any irregularities are due to artifacts or actual pathological or abnormal conditions, and whether the views are clear enough for medical interpretation. Performer may ask opinion of another radiologist.
   b. Determines whether the splenoportograms adequately demonstrate the organ and venous structures being studied, and provide sufficient information about any pathology, blockage, or distortion of the flow, the extent and location of any malformation, the presence of aneurysms, and other signs of abnormal structure or pathology.
   c. Performer considers whether to inject additional contrast, repeat injection and filming with change in technical factors.

      i) Considers the patient's condition, the contraindications, the information already supplied and urgency. May discuss with anesthesiologist and/or clinician.
      ii) For additional injections, change of position, change in technical factors, performer reviews decisions on amount of contrast, rate and speed of serial programs; indicates what is needed to staff and repeats as appropriate. Allows appropriate elapse of time between injections for patient to respond optimally.
      iii) Repeats relevant steps for additional splenoportograms as described above. Repeats review as described above until satisfied that the films are technically

List Elements Fully

adequate to demonstrate the areas and conditions under study and to provide sufficient information to make possible a competent medical interpretation.

9. Throughout procedure performer evaluates how the patient is responding. May decide to provide emergency care:

   a. Performer determines the severity of the patient's reaction by listening for heartbeat, respiration; may check blood pressure; may take EKG reading, using equipment on emergency cart.
   b. If patient has a severe reaction to the procedure or contrast medium, such as cardiac arrest, anaphylactic shock (exaggerated negative reaction to the foreign substance), bronchospasm or laryngospasm (stricture of bronchial tubes or larynx), hypotension (drop in blood pressure), cyanosis (bluish discoloration due to excessive concentration of reduced hemoglobin in blood), urticaria (vascular skin reaction), or violent sneezing, performer proceeds at once with emergency life support or measures to control the reaction:

      i) May call anesthesiologist or life support team at once.
      ii) May administer oxygen or air using oxygen tank and mask or ambu bag; may clear airway using finger or tongue blade.
      iii) May decide to establish an airway by removing any dentures and, using a laryngoscope (to view larynx) insert an endotracheal tube.
      iv) May apply closed chest cardiac massage.

TASK DESCRIPTION SHEET (continued)

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v) Depending on ECG results may apply defibrillator by selecting watt seconds, applying, and raising watt seconds until effective.
vi) Depending on ECG results may administer a prepared intracardial injection of a heart stimulant.
vii) May administer IV infusion; may order and administer a corticosteroid, an antihistamine or atropine.
viii) May administer Valium in solution through the injection catheter.

c. Performer decides whether the reaction is sufficiently controlled to proceed.

i) If performer decides to terminate procedure, notifies appropriate medical staff; orders aftercare as appropriate; has patient transported to appropriate location.
ii) Records patient's reactions and what was done on patient's chart. If appropriate, makes sure patient is informed of the type of drug that caused the reaction or explains to patient that he or she is allergic to the contrast solution (i.e. iodine-based solution).

d. If performer judges that patient displays a strong (but not emergency) allergic reaction:

i) Performer may order and administer a corticosteroid, an antihistamine or atropine.
ii) Records reaction and what was done. Explains if appropriate to patient that he or she is allergic to the contrast solution.

List Elements Fully

e. If patient shows signs of going into shock due to internal bleeding, performer has patient monitored and treated for shock at once. May place patient in Trendelenburg position; administers oxygen; may order transfusion; applies selective pressure to restore circulation to vital organs; may apply any emergency care procedures described above.

10. Performer decides when the radiographic examination is completed based on information on the angiograms and the patient's condition. Informs anesthesiologist (if present), technologist, and other staff that procedure is to be terminated.

a. Performer orders a plain film of the abdomen and reviews as soon as it is processed.

i) Performer evaluates whether there is any contrast medium deposited outside the spleen. If so, notes location.
ii) Performer determines what care if any should be provided to remove contrast. May explain to patient possibility of pain due to extra-splenic deposit of contrast and likely duration.

b. If patient is conscious, performer reassures patient and explains what will happen next.
c. Performer removes any connecting tubes or syringes from teflon sheath.
d. Performer gently and slowly withdraws the sheath. Manipulates by turning and pulling carefully, taking care not to injure or enlarge the wound at the entry point.

TASK DESCRIPTION SHEET (continued)

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List Elements Fully	List Elements Fully
e. Performer applies compression at the puncture site with the fingertips and/or sterile gauze for an appropriate amount of time. f. Performer applies or orders pressure dressing to be kept in place appropriate amount of time. g. Has patient lie on the left side for appropriate number of hours to apply mechanical compression. h. Performer may order fluids to be given intravenously or by mouth. May order bed rest for appropriate period while patient recovers from effects of procedure. i. Arranges to have puncture site, pulse rate and blood pressure examined regularly over the next few hours, and any problems reported at once. Informs patient or attending staff to report further oozing of blood or swelling. j. Performer may order skin care, tests, fill out order forms. May order medication. k. Has appropriate sanitary clean up procedures carried out. l. If requested, calls surgeon or clinician and reports preliminary results and findings. 11. Performer records impressions of procedure on patient's chart: a. Preliminary findings. b. How patient tolerated procedure. c. Any special nursing follow-up recommended, tests, records and observation required, medication, later studies ordered. d. May sign chart, requisition sheet or order forms.	

TASK DESCRIPTION SHEET

Task Code No. 476

This is page 1 of 12 for this task.

1. What is the output of this task? (Be sure this is broad enough to be repeatable.)

Pt. examined,reassured;decisions made on going ahead, technique,site of puncture(s),contrast medium,type of injection,filming;preparatory orders given;site anesthetized;artery punctured;guide wire and catheter advanced;injection and filming coordinated;angiograms reviewed;procedure repeated and/or aortography,selective catheterization continued until final approval;emergency care given;instruments removed;site compressed;orders for after care,tests,urogram,medical impressions recorded.

2. What is used in performing this task? (Note if only certain items must be used. If there is choice, include everything or the kinds of things chosen among.)

X-ray requisition form;pt.'s medical chart,prior films,scans;pen;view boxes;sterile tray with antiseptic,saline,anticoagulant,speculum;Y adaptor,swabs, tape,scissors,gauze,pressure dressing,local anesthetic,syringes,puncture needle,scalpels,guide wires, catheters;automatic injector;iodine-based contrast; x-ray table;film changer;fluoroscope,TV monitor;tourniquets;emergency cart;sterile gown,gloves,drape; shielding

3. Is there a recipient, respondent or co-worker involved in the task? Yes...(x) No...( )

4. If "Yes" to q. 3: Name the kind of recipient, respondent or co-worker involved, with descriptions to indicate the relevant condition; include the kind with whom the performer is not allowed to deal if relevant to knowledge requirements or legal restrictions.

Female pt.;attending MD;radiologist;surgeon;radiologic technologist;nurse

5. Name the task so that the answers to questions 1-4 are reflected. Underline essential words.

Conducting selective pelvic arteriography of non-pediatric gravid or nongravid female pt. by examining,reassuring pt.;obtaining consent;deciding on site,technique,prior preparation;deciding whether to go ahead, pressure injection,filming;injecting local anesthetic;making puncture;advancing catheter and guide wire;coordinating pressure injection of contrast and filming;evaluating angiograms;deciding on aortography,selective catheterization,repeat of injection as appropriate;providing emergency care;removing instruments;ordering after care,tests,delayed films; recording orders,medical impressions.

List Elements Fully

Performer receives the x-ray requisition form and medical chart of a gravid or nongravid female patient scheduled for pelvic arteriography (radiographic contrast study of uterine arteries, placentography and/or ovarian arteries by means of catheter abdominal aortography and/or selective catheterization) prior to the procedure, such as on the previous day or evening.

1. Performer reads the patient's medical history and requisition form to review the case or to become familiar with materials seen earlier in consultation, in order to make decisions about the conduct of the radiographic study and to check on the request of the referring physician:
   a. Performer notes the patient's age, weight, height, evidence of nongravidity or pregnancy; if gravid, duration of current pregnancy. Notes the name of the referring clinician or surgeon.
   b. Notes the nature and location of the suspected pathology or symptomology, such as abnormal placental insertion, intrauterine or extrauterine location of fetus,abruptio placenta, pelvic, ovarian tumors,or trophoblastic tumors.
   c. Performer notes the purpose of the study,such as

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6. Check here if this is a master sheet..(x)

TASK DESCRIPTION SHEET (continued)

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This is page 2 of 12 for this task.

List Elements Fully	List Elements Fully
primary or differential diagnosis, localization of the placenta, evaluation of therapy, and/or placement of catheters for chemotherapy. d. Performer reviews the diagnostic information already obtained, including any prior radiographic studies, radioisotope scans, ultrasonograms, results of clinical tests, lab and sensitivity tests, EKG, vital signs, clotting time tests. e. Performer notes relevant prior obstetrical, gynecological and general medical history; notes history of removal of any section of the reproductive or vascular systems, grafts and their sites, history of atherosclerosis, heart disease, Hypotension, hypertension, renal disease, thrombosis, abnormal bleeding tendency, anticoagulation therapy, history of allergies or indications of allergy to iodine-based contrast media. Notes stage of nongravid patient's menstrual cycle, any possibility of pregnancy, whether on oral contraceptive. Notes whether patient has an infectious or communicable condition, especially local infection at possible puncture site. f. Notes whether prior orders have been given to improve patient's clinical condition; if so, notes progress. g. Performer notes recommendations on technique, use of equipment and materials. h. Checks to see whether patient has signed consent for procedure. If not, may decide to obtain personally before sedation is given. i. Performer may discuss case with referring clinician, specialist, or surgeon to obtain additional information. May arrange for attending physician and/or surgeon	to accompany performer in examination of patient on day prior to the procedure. 2. Performer visits patient and any authorized adult at bedside or in appropriate location. May be accompanied by clinician, surgeon, or appropriate specialist. a. Performer greets patient and explains that a brief examination will occur. If any colleagues are with performer, performer introduces them. b. Performer reads patient's chart. Notes any new clinical developments, response to care or medication. May ask patient about symptoms and allergies. Examines the patient for relevant symptoms and general state. Reassures and answers questions. If not already done, performer determines whether there is any possibility of pregnancy in the case of a nongravid female patient, whether patient has been taken off any oral contraceptive. c. Performer considers whether there have been changes in the patient's (or fetus's) condition since the decision was made to do the procedure, and considers whether there are contraindications to going ahead with the procedure. May confer with specialist, clinician, or surgeon; discusses patient's current condition. Decides whether to proceed, cancel, or delay procedure based on assessment of patient's current condition and any discussion. d. If performer decides to proceed, examines femoral pulses to evaluate and select entry site:

TASK DESCRIPTION SHEET (continued)

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This is page 3 of 12 for this task.

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- i) Notes strength and expansive nature of the pulsations, presence of bruits (murmurs), presence of grafts, presence and location of ischemic symptoms, local infection.
- ii) Performer considers the condition of the pulses, clinical and surgical history, age of patient and nature of symptoms. Selects side and puncture site (or bilateral catheterization for chemotherapy) considering condition of area. Avoids puncture site where there is severe atherosclerotic involvement, scars or grafts. Favors right femoral artery over left.
- iii) Performer examines and records presence and character of pulses at, and distal to, the artery(s) to be punctured.

e. If performer decides not to have procedure done, may discuss with clinician. Records reasons for cancellation and any recommendations for alternative procedure on patient's chart. Informs staff of cancellation and discusses with patient.

f. Performer may decide to delay procedure, have patient undergo treatment to improve clinical condition, such as treatment for low or high blood pressure, anemia infectious condition, or malnutrition. Discusses as appropriate and has orders given for care of patient. If patient has been on anticoagulant therapy, may order cessation until prothrombin and/or clotting times are within normal levels. May order cessation of oral contraceptive if not already done. With emergency patient may determine whether delay is contraindicated.

List Elements Fully

g. If performer decides to proceed and a consent for the procedure has not been obtained, performer may explain to the patient in comprehensible language what will occur in the procedure, its purpose, and the dangers to the patient involved. Performer explains the alternatives; answers questions.

- i) When the performer is sure that the patient understands the risks, asks the patient for signature on consent form and checks that it is properly signed.
- ii) If a consent is not agreed to, performer postpones procedure until it is obtained. May discuss with appropriate physician or individuals and/or with patient. Does not proceed unless consent is obtained.

h. Performer makes preliminary decision in the technique and type of equipment to use based on institutional facilities and nature of study:

- i) Selects site for placement of catheter tip such as in distal abdominal aorta, common iliac artery, depending on area of interest and patient's condition. May plan to consider selective catheterization of ovarian arteries.
- ii) Depending on whether or not patient is pregnant, performer may select premarked catheter for use instead of fluoroscopic control. Notes the length required for placement of mark.

TASK DESCRIPTION SHEET (continued)

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This is page 4 of 12 for this task.

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May indicate types, sizes and lengths of catheter(s), whether J-shaped, preshaped, closed-end with side holes, whether radiopaque. May specify type of safety guide wire, floppy wire, size and type of needle.

iii) Performer estimates the probable number of views needed to ensure minimum exposure and adequate information, especially for pregnant patient. Decides on use of serial film changer or conventional x-ray unit.

iv) Selects type and amount of contrast solution based on size of patient, stage of pregnancy, and areas to be visualized. Selects local anesthetic.

v) Decides whether to use manual or automatic pressure injection equipment as appropriate.

vi) Decides whether to use compression with tourniquets.

vii) For placentography may order vaginal speculum to define position of external cervical os.

i. Performer may order prior preparation of patient such as sedation, period for withholding of food, hydration, use of prior IV drip, cleansing enemas, shaving of entry site(s), prior administration of antihistamine, medications to deal with problems of blood clotting. Considers contraindications for fetus. May order EKG (ECG) monitoring.

3. Just prior to the time for which the procedure is scheduled, the performer reviews all the relevant medical information and the patient's chart. Reviews relevant prior radiographs.

List Elements Fully

Notes any new developments.

a. Performer greets patient in examination room. May question about symptoms; reassures and explains what will occur.

b. Performer checks that all prior preparatory procedures have been carried out.

   i) Checks report on electrolyte levels, blood clotting time, vital signs.

   ii) Checks that any orders for hydration, starting of IV infusion, cleansing enemas, prior administration of medication and/or sedation have been carried out, and at appropriate time. If not arranges to have these done and/or procedure delayed.

c. Performer examines puncture site (s) to review earlier decision. Makes sure no swelling or tenderness is present. Considers alternative puncture site(s) if appropriate. Indicates puncture site(s) to staff.

d. Performer considers whether patient's current condition presents any contraindications to going ahead with the procedure. May have clinician or specialist called; discusses patient's condition and any alternative steps. Decides whether to proceed or not based on need, evaluation of patient's condition and contraindications.

e. If performer decides not to proceed, records reasons and any recommendations on patient's chart. Informs appropriate coworkers of cancellation and has patient returned to room. If appropriate, orders rescheduling

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List Elements Fully

of patient or scheduling for alternative procedure.

f. May order sedation and/or IV drip if appropriate and not already administered. Has puncture site and possible alternative sites shaved and prepared. May have patient's vulva, perineum and vagina cleansed with antiseptic solution or does so personally, in preparation for insertion of speculum.

g. Performer may attempt to allay patient's fears and enlist cooperation; answers questions. Explains that patient will be asked to hold still from time to time. Indicates what will happen, what pain might be experienced, and what cooperation will be needed. Stresses need to maintain positions when ordered.

h. Performer makes final decisions on technique and procedures:

  i) Decides on or checks sizes of needles, catheters, guide wires. Checks or orders type and amount of iodine-based contrast solution, use of manual or automatic injection, use of conventional or serial changer, use of compression.
  ii) Performer decides on program for any seriography, and proper elapse of time to provide venograms if appropriate. Informs technologist of the number of films to be taken, the per-second intervals, and the number of series anticipated. Has equipment checked.
  iii) If appropriate, has technical factors set for fluoroscopy.
  iv) Informs appropriate co-workers of decisions so that patient and materials can be prepared.

List Elements Fully

4. Performer returns to patient in procedure room when informed that patient and equipment are ready:

a. Checks whether patient has been properly shielded, immobilized, and prepared for sterile puncture procedure. If not acceptable, indicates the needed adjustments. May decide to immobilize personally.

b. Checks sterile tray prepared for procedure. Requests any missing objects.

  i) Performer checks that appropriate needle and catheter sizes and lengths are available and catheters preformed and/or premarked appropriately. Checks safety guide wires. May bend catheters personally.
  ii) Checks that syringes with saline and/or anticoagulant solution are prepared.
  iii) Checks appearance of contrast medium to be sure there is no chemical deterioration; checks amount.
  iv) May prepare syringe with local anesthetic or checks.

c. If patient has special equipment such as IV or indwelling catheter, performer makes sure that these are being monitored. May check that EKG monitoring equipment is present. Checks that emergency cart is present.

d. Checks, if ordered, that seriography equipment is ready for use, that technical factors are set for seriography and fluoroscopy, and that equipment for pressure injection is checked and ready for use.

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e. Dons protective lead garments and sterile gown and gloves when appropriate. Checks staff shielding.

f. If patient is coherent, performer explains what will be done. Answers patient's questions as appropriate. Reassures patient and does so as deemed needed throughout procedure.

g. If placentography is to be done, may insert sterile radiopaque vaginal speculum:

  i) Has patient prepared in lithotomy position.

  ii) After vulva, perineum and vagina are cleansed, has area draped with sterile towels. Makes sure fresh sterile gown and gloves are donned after cleansing.

  iii) Performer uses water soluble lubricant; inserts a sterile vaginal speculum and places it against the external cervical os.

5. Performer prepares the site(s) for unilateral or bilateral puncture using sterile technique. For each site:

  a. Has patient positioned appropriately for puncture of femoral artery, with access below the inguinal ligament and as high as possible, but allowing for later compression of the vessel proximal to the puncture site.

  b. Performer locates the vessel for puncture visually and/or by feeling for arterial pulsation in the location selected. May choose more palpable position in vessel allowing for later compression.

  c. Prepares the site for injection of the local anesthetic and puncture by swabbing with prepared antiseptic solution. Covers surrounding areas with sterile drapes, leaving only small area of injection and puncture uncovered.

  d. Checks amount of local anesthetic to be injected as shown by nurse in syringe, or draws anesthetic into sterile syringe. Checks no air is present. Inserts needle intradermally and subcutaneously; injects. Makes sure to infiltrate the skin and the sheath of the artery on both sides of the vessel. Removes needle. Waits for area to become anesthetized.

6. Performer proceeds with selective "Seldinger" catheterization as follows:

  a. If patient is coherent, explains when patient is to hold steady for puncture.

  b. Performer feels for the appropriate arterial pulse by palpating with fingers. Makes an incision or nick through the skin with a sterile scalpel at the site where the needle and catheter will enter.

  c. Performer inserts puncture needle tip (appropriately sized hollow needle with sharp cutting inner stylus or teflon needle tip equipped with stylet and teflon sheath) into the incision while palpating and fixing the artery. Performer angles needle to enter along the lateral side of the vessel with the tip directed along the course of the artery. May attempt to enter only the anterior arterial wall.

  d. Performer pulls out the needle's inner stylus and withdraws the needle slowly until a characteristic "pop" is felt and a vigorous jet of arterial blood is ob-

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tained. May pull back on needle, reinsert, or make other incisions until artery is successfully entered.

- i) With teflon needle performer removes stiff inner needle leaving teflon sheath in place.
- ii) May advance needle or sheath several inches into lumen of vessel in the direction of the route to be catheterized.

e. Performer inserts a curved tip safety guide wire into the needle or sheath and advances this into the vessel in the direction of the planned route for catheterization. May advance guide wire before removing needle or sheath and introducing catheter.
f. Once the guide wire is inserted, performer withdraws the hollow needle or sheath, compressing the artery to reduce the bleeding. Cleans blood off guide wire. Inserts the appropriate size catheter by threading catheter over the guide wire and into the artery.
g. Performer decides whether to advance the catheter using the guide wire as a leader or to remove guide wire. If so decided, removes guide wire.
h. Adjusts position of guide wire and/or catheter to be sure that the catheter is free to pass along the lumen of the vessel.
i. If performer judges that entry through femoral site chosen cannot be properly accomplished, performer may decide to enter from the opposite artery if appropriate. If so, performer repeats appropriate steps for new location after caring for initial site.

List Elements Fully

j. If entry or placement cannot be easily accomplished, performer may decide to terminate so as to avoid further trauma to vessels. If so, performer records as appropriate and informs staff. May arrange for rescheduling.

7. Performer advances the catheter (with or without guide wire as a leader):

a. May use fluoroscopic control for nongravid patient. With pregnant patient, advances catheter to premarked point.
b. In advancing the catheter and/or guide wire, performer is careful not to force passage.
c. For placentography, advances catheter to a level at or slightly above the aortic bifurcation or distal abdominal aorta.
d. For patient with suspected abdominal pregnancy, positions catheter at the level of the first lumbar vertebra.
e. For uterine arteriography, places catheter into external iliac artery or common iliac artery.
f. For aortography to show the pelvic vessels including ovarian, places catheter tip in aorta at the level of the renal arteries.
g. For bilateral catheterization for chemotherapy, inserts catheter into internal iliac artery and repeats procedure for opposite side. Connects the catheters with a "Y" adaptor when appropriate.
h. If so decided, performer may use fluoroscopy to check position of catheter or evaluate an obstacle in the path of catheter as follows:

- i) Performer uses syringe prepared with a small amount of

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the contrast solution. Checks that medium is appropriate. Connects syringe to the catheter.

ii) Positions the overhead fluoroscope unit over the patient; may have lights in room dimmed; activates the fluoroscope; adjusts technical factors or has this done.

iii) Performer has patient hold still. Injects a small amount of the solution into the artery for viewing location of catheter tip and guide wire.

iv) Locates site of entry of catheter and checks position of catheter within vessel by viewing on TV monitor. Performer judges whether catheter is correctly inserted in lumen of vessel rather than in an intramural or extravascular position by viewing on TV monitor and watching flow of test dose.

i. After checking placement, removes guide wire if not already done. Performer attaches syringe(s) prepared with saline and/or an anticoagulant to catheter(s). Flushes catheter(s) periodically to avoid clotting and to keep catheter clear.

8. If performer has decided to use compression of the femoral arteries to improve density of contrast, proceeds as follows:

a. Performer may apply tourniquets to both femoral arteries.
b. Applies tourniquets high up in the groin, distal to the level of the puncture point.
c. Inflates or tightens for several minutes before injection and maintains during filming.

List Elements Fully

9. Performer prepares for immediate injection of contrast and filming:

a. Has patient placed in supine position.

i) May order two, three or four AP projections timed as appropriate for post-injection arterial and venous phases.

ii) May order only one projection to reduce radiation exposure, timed as appropriate after injection. Orders AP, lateral or oblique projection as appropriate.

iii) May order x-ray tube to be at right angles, 15° cephalad, 5° caudad, depending on the area of interest.

b. Makes sure proper (close) collimation will be observed and any appropriate shielding possible is in place.

c. If pressure injection is to be done by hand, performer prepares or checks syringe with the iodine based, aqueous contrast solution for correct quantity, depending on vessels to be opacified. Attaches to catheter. Checks that there is no air in system.

d. If pressure injection is to be done by automatic injector, performer prepares to coordinate injections with filming:

i) Checks that the automatic injector (used for introduction of the contrast solution under pressure) is loaded with proper amount of medium in syringe(s); checks that syringe is attached to injector tubing. Attaches tubing to catheter. Checks that there is no air in system.

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ii) Performer checks on or orders the rate and pressure setting for the entry force for the automatic injector. Considers the force of entry needed to inject the contrast medium into the vessels of interest given the technique, vessel, and other conditions involved.

e. For serial or conventional filming checks with the technologist the rate of speed, exposure times and intervals selected in relation to the end of the injection of the contrast solution, including any need for filming of venous phase.

f. Performer directs injection and filming:

i) Performer may enter control room. Has patient hold steady when appropriate.

ii) If performer injects the contrast solution by hand, does so in predetermined amount decided; tells technologist when to activate the automatic film changer or exposure control.

iii) If performer uses automatic injector, activates, and tells technologist when to start the automatic film changer to take the series of pre-programmed radiographs, or when to make exposure.

g. Performer has pelvic arteriograms processed at once.

10. While arteriograms are being processed, performer examines and talks to patient to evaluate how the patient (and fetus) has responded to the procedure and the injection.

a. Detaches injector tubing; reflushes puncture site.

List Elements Fully

b. If EKG is being monitored, evaluates any changes during initial injection as possible contraindication for additional injections.

c. May decide to provide emergency care at any time throughout procedure if patient shows signs of adverse reactions.

11. Performer looks at the first set of pelvic arteriograms or aortograms on view boxes (in sequence) as soon as they are processed.

a. Checks for technical quality, and notes whether any irregularities are due to artifacts or actual pathological or abnormal conditions, and whether the views are clear enough for medical interpretation. Performer may ask opinion of another radiologist.

b. Determines whether the angiograms adequately demonstrate the vessels and structures being studied, and provide sufficient information about location of placenta, fetus, pathology, blockage, or other signs of normal or abnormal structure or pathology.

c. Performer considers whether to inject additional contrast, repeat injection and filming with change in technical factors or patient position.

d. For additional injections, change of position, change in technical factors, performer reviews decisions on injection pressure, amount of contrast, rate and speed of serial programs or conventional filming.

i) Indicates what is needed to staff and repeats as appropriate.

ii) Allows appropriate elapse of time between injections for pa-

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tient to respond optimally. Reflushes puncture site.

- e. Repeats relevant steps for repeat or additional angiograms as described above. Repeats evaluation as described above until satisfied that the angiograms are technically adequate to demonstrate the areas and conditions under study and to provide sufficient information to make possible a competent medical interpretation.
- f. Removes any tourniquets.

12. If the ovarian arteries are of interest and performer decides that they are not adequately visualized on pelvic arteriograms, performer may decide on abdominal aortography as described above.

    - a. If performer decides on aortography after catheterization of the iliac artery, performer reintroduces guide wire into catheter.
    - b. Advances catheter from iliac artery into abdominal aorta to the level of the renal arteries.
    - c. Proceeds with injection, filming and evaluation of aortogram(s) as described above.

13. Performer may evaluate the details of the aortogram(s) to determine whether selective catheterization of the ovarian artery is necessary or whether sufficient information is provided on the aortogram(s). Notes whether size of any artery visualized is abnormal and should be selectively studied.

    - a. If performer decides on selective catheterization of ovarian artery, examines aortograms for location of origin of ovarian vessels. May decide to catheterize renal arteries to locate origin.

List Elements Fully

- b. If selective ovarian or renal arteriography is to be done after the abdominal aorta has been entered, performer reinserts guide wire until it reaches the proximal catheter tip. Uses fluoroscopic control. If a straight catheter has been used, may then remove catheter and thread a curved catheter over the guide wire as described. Advances catheter (with guide wire as leader if so decided) to appropriate location.
- c. With patient supine, performer directs the preshaped catheter above the origin of the artery to be studied first, using safety guide wire, small test doses and fluoroscopy control as described.
- d. Performer withdraws the guide wire and pulls back the catheter until the curved tip slips into the artery selected for study.
- e. Performer prepares for hand injection as described. Checks and sets up for serial filming as described above. Encourages patient to report any pain during injection as indication that catheter is plugging a vessel.
- f. Performer views the arteriograms after each injection to determine whether additional catheterization or positioning is required. Continues until satisfied with diagnostic information.
- g. Performer reflushes the catheter periodically with saline and/or anticoagulant. Maintains check on condition of patient. Allows appropriate period of time between injections for reactions to contrast to dissipate.

14. Throughout procedure performer evaluates how the patient is responding. May decide to provide emergency care.

TASK DESCRIPTION SHEET (continued)

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This is page 11 of 12 for this task.

List Elements Fully

a. Performer determines the severity of the patient's reaction by listening for heartbeat, respiration; may check blood pressure; may take ECG reading, using equipment on emergency cart.
b. Checks on condition of fetal heart beat if appropriate. If patient has a severe reaction to the procedure or contrast medium, such as cardiac arrest, anaphylactic shock (exaggerated negative reaction to the foreign substance), bronchospasm or laryngospasm (stricture of bronchial tubes or larynx), hypotension (drop in blood pressure), cyanosis (bluish discoloration due to excessive concentration of reduced hemoglobin in blood), urticaria (vascular skin reaction), or violent sneezing, performer proceeds at once with emergency life support or measures to control the reaction.

    i) May call anesthesiologist or life support team at once.
    ii) May administer oxygen or air using oxygen tank and mask or ambu bag; may clear airway using finger or tongue blade.
    iii) May decide to establish an airway by removing any dentures and, using a laryngoscope (to view larynx) insert an endotracheal tube.
    iv) May apply closed chest cardiac massage.
    v) Depending on ECG results may apply defibrillator by selecting watt seconds, applying, and raising watt seconds until effective.
    vi) Depending on ECG results may administer a prepared intracardial injection of a heart stimulant.
    vii) May administer IV infusion; may order and administer a corticosteroid, an antihistamine or atropine.

List Elements Fully

    viii) May administer Valium in solution through the injection catheter.

c. Performer decides whether the reaction is sufficiently controlled to proceed.

    i) If performer decides to terminate procedure, notifies appropriate medical staff; orders aftercare as appropriate; has patient transported to appropriate location.
    ii) Records patient's reactions and what was done on patient's chart. If appropriate, makes sure patient is informed of the type of drug that caused the reaction or explains to patient that she is allergic to the contrast solution (i.e. iodine-based solution).

d. If performer judges that patient displays a strong (but not emergency) allergic reaction:

    i) Performer may order and administer a corticosteroid, an antihistamine or atropine.
    ii) Records reaction and what was done. Explains if appropriate to patient that she is allergic to the contrast solution.

e. If performer notes any signs of arterial or venous spasm, may inject an anticoagulant, and/or apply hot packs at once to avoid thrombotic occlusion.

15. Performer decides when the radiographic examination is completed based on information on the angiograms and the patient's condition. Informs technologist, and other staff that procedure is to be terminated.

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List Elements Fully

a. Performer returns to the patient. Reassures and explains what will happen next.
b. May inject an anticoagulant. Removes any connecting tubes or syringes from catheter(s).
c. Unless catheters will be left in place for chemotherapy, performer gently and slowly withdraws the catheter. Manipulates catheter by turning and pulling carefully, taking care not to injure the vessel or enlarge the wound at the entry site.
d. Performer compresses the vessel proximal to or at the puncture site with the fingertips and/or sterile gauze for an appropriate amount of time.

    i) Does not totally occlude the artery. Checks that there is a pulsation distal to the puncture site and no hematoma at the site.
    ii) May have a staff member continue the compression for the time needed. Makes changeover so as to maintain pressure by withdrawing own hands from under those of the relieving staff member once they are in place.

e. Performer applies or orders pressure dressing to be kept in place appropriate amount of time.
f. Performer may order fluids to be given intravenously or by mouth. May order bed rest for appropriate period while patient recovers from effects of procedure.
g. Arranges to have puncture site, extremities and arterial pulses examined regularly over the next few hours and any problems reported at once. Informs patient or attending staff to report further oozing of blood or swelling.

List Elements Fully

h. Performer may order careful observation of patient including vital signs, urinary output, and skin care. May order tests, fill out order forms. May order medication.
i. May order delayed urogram appropriate amount of minutes after last injection.
j. Has appropriate sanitary clean up procedures carried out.
k. If requested, calls surgeon or clinician and reports preliminary results and findings.

16. Performer records impressions of procedure on patient's chart:

    a. Preliminary findings.
    b. How patient tolerated procedure.
    c. Any special nursing follow-up recommended, tests, delayed films ordered, records and observation required, medication, later studies ordered.
    d. May sign chart, requisition sheet or order forms.

TASK DESCRIPTION SHEET

Task Code No. 477

This is page 1 of 16 for this task.

1. **What is the output of this task? (Be sure this is broad enough to be repeatable.)**

Pt. examined,reassured;decisions made on going ahead, preparation,method,site,contrast,equipment,serial program,injection pressure,rate;site anesthetized; vein punctured or cut down;guide wire,catheter advanced under fluoroscopy;heart,pulmonary pressure recorded;injection and filming coordinated;angiograms reviewed;selective catheterization repeated,continued as decided;emergency care given;instruments removed;site compressed;cut down sutured;orders for after care,tests,delayed films,medical impressions recorded.

2. **What is used in performing this task? (Note if only certain items must be used. If there is choice, include everything or the kinds of things chosen among.)**

X-ray requisition form;pt.'s medical chart,prior films,scans;pen;view boxes;sterile tray with antiseptic,saline,anticoagulant,suture materials,forceps, swabs,tape,scissors,gauze,pressure dressings,local anesthetic,syringes,puncture needle,scalpels,clamps, guide wire,catheters;tourniquet;automatic injector;iodine-based contrast;x-ray table;film changer; fluoroscope,TV monitor;spot film device;manometer; cardiac monitoring equipment;emergency cart;sterile gown,gloves,drape;shielding

3. **Is there a recipient, respondent or co-worker involved in the task?** Yes...(x) No...( )

4. **If "Yes" to q. 3: Name the kind of recipient, respondent or co-worker involved, with descriptions to indicate the relevant condition; include the kind with whom the performer is not allowed to deal if relevant to knowledge requirements or legal restrictions.**

Any pt.;authorized adult;attending MD;radiologist;anesthesiologist;surgeon;radiologic technologist;nurse; cardiac team;cardiologist

5. **Name the task so that the answers to questions 1-4 are reflected. Underline essential words.**

Conducting catheter pulmonary angiography of any pt. by examining reassuring pt.,obtaining consent;deciding on route,technique,injection site,prior preparation;deciding whether to go ahead,pressure for injection,type filming;injecting local anesthetic;making puncture or cut down;advancing catheter and guide wire under fluoroscopic control;making test dose,cardiac and pulmonary pressure readings;coordinating injection and filming;evaluating angiograms;deciding whether to repeat,do selective pulmonary catheterization;assisting with emergency care;removing instruments;suturing cut down;ordering after care,tests,delayed films;recording orders,medical impressions.

List Elements Fully

Performer receives the x-ray requisition form and medical chart of a patient scheduled for pulmonary angiography (radiographic contrast study of the pulmonary arteries and veins by means of selective catheterization of right atrium or ventricle (selective angiocardiography), or main pulmonary artery, and/or right and/or left branch pulmonary arteries (selective pulmonary angiography), prior to the procedure, such as on the previous day or evening, or, in an emergency, immediately before the procedure.

1. Performer reads the patient's medical history and requisition form to review the case or to become familiar with materials seen earlier in consultation, in order to make decisions about the conduct of the radiographic study and to check on the request of the referring physician:
   a. Performer notes the patient's age, sex, weight, height, the name of the referring clinician or surgeon.
   b. Notes the purpose of the requested study, such as for information prior to surgical embolectomy, preliminary or supplementary diagnosis such as pulmonary thromboembolism, massive or nonmassive pulmonary embolism, arteriovenous malformation,study

OK-RP;RR;RR

6. Check here if this is a master sheet..(x)

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List Elements Fully

of pulmonary vascular structure and changes. Notes the nature and location of the suspected pathology or the symptoms, whether purpose is extracardiac or involves study of the heart structures; notes whether case is to be treated as emergency, notes whether thromboembolic disease is suspected.

c. Performer notes relevant prior history such as prior incidents of vascular constriction, mitral valve disease, pulmonary hypertension, thromboembolic disease, recurrent suspected microemboli, removal of any section of the vascular system, grafts and their sites, history of heart, renal, pulmonary, or liver disease, history of allergies or indications of allergy to iodine-based contrast media, abnormal bleeding tendency, anticoagulation therapy.

d. Performer reviews the diagnostic information already obtained, including any prior radiographic studies, radioisotope scans, ultrasonograms, results of clinical tests, lab and sensitivity tests, ECG, vital signs, clotting time tests. If already done, notes results of allergy test, clotting time tests; notes stage of female patient's menstrual cycle, any possibility of pregnancy, whether on oral contraceptive. Notes if patient has infectious or communicable condition, especially at possible puncture site.

e. Notes whether prior orders have been given to improve patient's clinical condition; if so, notes progress.

f. Performer notes recommendations on method of examination, such as entry site and route for catheterization, site for injection (where catheter tip is to be placed), whether there is need for surgical "cut down" technique or closed percutaneous approach. Notes recommendations on equipment, use of local or general anesthesia.

g. Checks to see whether patient or authorized adult has signed consent form. If not, may decide to obtain personally before sedation.

h. Performer may discuss case with referring clinician, cardiologist, or surgeon to obtain additional information. May arrange for attending physician to accompany performer in examination of patient.

2. Performer visits patient and any authorized adult at bedside or in appropriate location. May be accompanied by clinician, anesthesiologist, surgeon, or cardiologist. With emergency patient may combine the function of prior day visit with that done immediately before the procedure.

   a. Performer greets patient and/or authorized adult and explains that a brief examination will occur. If any colleagues are with performer, performer introduces them.

   b. Performer reads patient's chart. Notes any new clinical developments, response to care or medication. May ask patient or accompanying adult about symptoms and allergies. Examines the patient for relevant symptoms and general state. Reassures and answers questions. If not already done, performer determines whether there is any possibility of pregnancy in the case of a female patient, whether patient has been taken off any oral contraceptive.

   c. Performer considers whether there have been changes in the patient's

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condition since the decision was made to do the procedure, and considers whether there are contraindications to going ahead with the procedure. May confer with specialist, clinician, or surgeon; discusses patient's current condition. Decides whether to proceed, cancel, or delay procedure based on assessment of patient's current condition and any discussion.

d. If performer decides to proceed, examines patient to help determine appropriate site and method for introduction of catheter.

- i) Performer considers either femoral vein below the inguinal ligament (unless there is a known history of pulmonary thromboembolism).
- ii) May consider the antecubital vein (especially left). Notes whether the vein is palpable or whether a "cut down" procedure would be required to reach it.
- iii) May also consider the possibility of entering the right subclavian vein, the right internal jugular, or the left axillary vein.
- iv) Notes the presence of grafts, location of ischemic symptoms, local infection. Considers the condition of the vessel, its ease of palpation, patient's clinical and surgical history, age of patient, and nature of symptoms. Considers the specific contraindications for each route.
- v) Selects preferred entry site and side most appropriate for the individual patient, and notes alternative second choice.
- vi) Performer decides on site for injection. Plans on catheterization of main pulmonary artery and/or right and/or left pulmonary branch unless there is specific need to visualize heart or pulmonary valve. May decide on right atruim. May select right ventricle for investigation of congenital heart disease, but avoids choice of this site if possible.
- vii) Performer decides on appropriate needle size and type, appropriate catheter sizes and lengths, number of preformed curves, (depending on side chosen) type of end, whether straight, j-shaped, "pigtail," whether closed or open ended, whether with side holes, type of safety guide wires. Considers the selected entry site, route, injection site, age and size of patient.
- viii) Performer decides on type and quantity of iodine-based contrast solution based on the patient's size, age, site of injection, and area of interest.
- ix) Performer decides on the type of equipment to use based on the nature of the study and institutional facilities. May order serial single or biplane cassette changer, magnification technique, spot filming, depending on area of interest, purpose of study and nature of pathology. Orders pressure injector. If magnification is to be used, orders x-ray tube with an appropriately small fractional focal spot and a table capable of adequate elevation.

e. If performer decides not to have procedure done, may discuss with clinician. Records reasons for cancellation and any recommendations for alternative procedure

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on patient's chart. Informs staff of cancellation and discusses with patient.

f. Performer may decide to delay procedure, have patient undergo treatment to improve clinical condition, such as treatment for blood pressure, anemia, infectious condition, or malnutrition. Discusses as appropriate and has orders given for care of patient. If patient has been on anticoagulant therapy, may order cessation until prothrombin and/or clotting times are within normal levels. May order cessation of oral contraceptive if not already done. With emergency patient may determine whether delay is contraindicated.

g. If performer decides to proceed and a consent for the procedure has not been obtained, performer may explain to the patient or guardian in comprehensible language what will occur in the procedure, its purpose, and the dangers to the patient involved. Performer explains the alternatives; answers questions.

   i) When the performer is sure that the patient understands the risks, asks the patient for signature on consent form and checks that it is properly signed.
   ii) If a guardian is to sign, performer explains to the individual as appropriate.
   iii) If a consent is not agreed to, performer postpones procedure until it is obtained. May discuss with appropriate physician or individuals and/or with patient. Does not proceed unless consent is obtained.

h. Performer decides on care to be provided for patient:

List Elements Fully

   i) Decides on use of general and/or local anesthetic. May discuss with anesthesiologist. If a general anesthetic is to be administered, performer arranges to have staff ready at the appropriate time.
   ii) Unless patient is to undergo examination at once, performer makes final decisions on prior preparation of the patient such as sedation, period for withholding of food, hydration, use of prior IV drip, cleansing enema, shaving of entry site, prior administration of antihistamine, medications to deal with problems of blood clotting, fluctuations in blood pressure.
   iii) May specify need for cardiac monitoring team and equipment (ECG, pressure, cardiac output, oxygen consumption, emergency care) based on institutional procedures. If a "cut down" will be required, may arrange to have this done by surgeon. If so, discusses with appropriate surgeon prior to procedure.

i. Performer records orders as appropriate so that patient and equipment can be prepared and staff assigned. May sign requisition; places for scheduling unless emergency procedure will be done at once.

j. May review with patient the procedures that will occur.

3. Just prior to the time for which the procedure is scheduled, the performer reviews all the relevant medical information and the patient's chart. Reviews relevant prior radiographs or scans. Notes any new developments.

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a. Performer greets patient in examination room. May question about symptoms; reassures and explains what will occur.

b. Performer checks that all prior preparatory procedures have been carried out.

   i) Checks report on electrolyte levels, blood clotting time, vital signs. Checks with cardiac monitoring team.

   ii) Checks that any orders for hydration, starting of IV infusion or transfusion, prior administration of medication and/or sedation have been carried out, and at appropriate time. If not arranges to have these done and/or procedure delayed.

c. Performer examines puncture site to review earlier decisions. Makes sure no swelling or tenderness is present. Considers alternative puncture site if appropriate. Indicates final puncture site to staff.

d. Performer may order scout film(s) of chest as appropriate for single or biplane views. Makes sure proper shielding is being used.

   i) Performer places the processed scout film(s) on view boxes and examines as soon as processed. Considers whether the areas of interest are visible, whether the technique is satisfactory, and whether the position(s) of the patient are correct.

   ii) If the scout(s) are not satisfactory, performer indicates the needed changes in technique or in the patient's position to the radiologic technologist.

   iii) Performer evaluates information on scout(s) for relevance to performing the catheterization.

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e. Performer considers whether patient's current condition presents any contraindications to going ahead with the procedure. May have clinician or specialist called; discusses patient's condition and any alternative steps. Decides whether to proceed or not based on need, evaluation of patient's condition and contraindications.

f. If performer decides not to proceed, records reasons and any recommendations on patient's chart. Informs appropriate coworker of cancellation and has patient returned to room. If appropriate, orders rescheduling of patient or scheduling for alternative procedure.

g. If patient is pediatric patient or if general anesthesia has been suggested for adult, performer may reconsider whether general anesthesia is still warranted; may decide to order if patient's behavior and condition suggest the need. If general anesthesia is to be carried out, performer discusses with anesthesiologist when it is to be administered and plans to coordinate with anesthesiologist and cardiac team.

h. May order sedation and/or IV drip or transfusion if appropriate and not already administered. Has puncture site and possible alternative sites shaved and prepared.

i. Performer may explain or demonstrate use of equipment to a child to allay fears and enlist cooperation; answers questions. Explains that patient will be asked to hold still from time to time. Indicates what will happen, what pain might be experienced, and what cooperation will be

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needed. Stresses need to maintain positions when ordered.

4. Performer makes final decisions on technique and surgical procedures:

   a. Based on entry site, decides whether cut down will be done and, if to be done by performer, materials required.
   b. Decides on type, size, length of catheters, type of end and curve. Selects single curve catheter for left antecubital, right internal jugular, right subclavian; and double curve for right antecubital; and pigtail (pulmonary artery seeking) reverse curve for femoral. May order dilators. Selects size of needle, guide wires, type and amount of contrast medium, use of automatic injection, use of biplane or single plane serial changer, magnification, spot filming.
   c. If a biplane study is involved, orders desired projections and/or angulation. Indicates whether biplane films will be taken simultaneously or sequentially.
   d. Performer decides on program for seriography, and proper elapse of time to provide venograms as appropriate. Informs technologist of the number of films to be taken, the per-second intervals, and the number of series anticipated. Has equipment checked.
   e. Has technical factors set for fluoroscopy.
   f. If performer decides on use of magnification technique with serial cassette changer(s), has technologist adjust height of table and x-ray tube(s) so that the ratio of the focal-film distance (FFD) to the focal-object distance (TOD) (focal spot to film distance divided by focal spot to table distance) is equal to the desired magnification. Has grid removed.
   g. If performer decides on use of spot film equipment with fluoroscopy, has technical factors set. If spot film equipment uses cassettes, chooses full, half, or quarter format and sets as appropriate. (If roll film attachment, checks that attachment is loaded with film or has this done.) If performer plans to use magnification technique with spot filming, plans to raise spot film device to appropriate height after positioning and collimating.
   h. If general anesthesia is to be administered, indicates to anesthesiologist when procedure is to start and allows for appropriate timing.
   i. Informs appropriate co-workers of decisions so that patient and materials can be prepared.

5. Performer returns to patient in procedure room when informed that patient and equipment are ready:

   a. Checks whether patient has been properly shielded, immobilized, and prepared for sterile puncture procedure. If not acceptable, indicates the needed adjustments. May decide to immobilize personally.
   b. Checks that cardiac team is prepared to monitor ECG, take pressure readings, monitor IV, and provide emergency care. Checks that emergency cart is present.
   c. Checks sterile tray prepared for procedure. Requests any missing objects.

      1) Performer checks that appropriate types and sizes of needles, catheters, and guide wires are

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present, that catheters are preformed as appropriate. Checks safety guide wires. May bend catheters personally.

- ii) Checks that syringes with saline and/or anticoagulant solution are prepared, that syringes with contrast medium, are ready.
- iii) Checks appearance of contrast medium to be sure there is no chemical deterioration; checks amount.
- iv) May prepare syringe with local anesthetic or checks.

d. Checks that seriography and/or spot film equipment is ready for use, that technical factors are set for seriography and fluoroscopy, and that equipment for pressure injection is checked and ready for use.

e. Dons protective lead garments and sterile gown and gloves when appropriate. Checks staff shielding.

f. If patient is coherent, performer explains what will be done. Answers patient's questions as appropriate. Reassures patient and does so as deemed needed throughout procedure.

g. If general anesthesia is to be administered, checks with anesthesiologist to be sure that the patient is ready for procedure to begin.

6. Unless already done, performer prepares the puncture site for insertion of the needle and catheter using sterile technique:

a. Has patient positioned appropriately for the injection site chosen so as to provide access, and locates the point of entry:

- i) For the femoral vein, has patient placed in supine position with access just below the inguinal ligament on the side selected. May rotate thigh externally and abduct slightly. Locates the vessel by finding the proximal pulse of the femoral artery and palpating a point just medial at 5 to 8 cm. below Poupart's ligament.
- ii) For the left antecubital vein (if available by palpation, or in preparation for cut down) has patient lie supine with left arm supported and cubital area exposed. May apply tourniquet to facilitate visual and tactile location of vein.
- iii) For a right subclavian vein approach, has patient lie in supine position and, on request, raise and lower head. Performer palpates for the scalenus anterior muscle separating the subclavian artery from the vein at the junction of the medial and middle third of the clavicle, about 2 cm. below the clavicle. On palpation of the vein, locates a point for entry above the first rib and under the clavicle.
- iv) For the right internal jugular vein, has patient placed in supine position and with head extended. May position table in the Trendelenburg position with patient's head somewhat down so that the veins in neck will be distended. Makes sure shoulders are not elevated. Performer palpates for a point two fingerbreadths below the angle of the mandible and directly over the carotid pulse. Plans to enter just lateral to the carotid pulse. Performer may distend the vein by applying a sling of sterile plastic

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tubing looped about the neck and pulled to occlude the vein below the puncture site.

v) For left axillary approach has patient lie supine with arm abducted and rotated so hand is palm upward and forearm parallel with patient's head. Performer locates the area of maximum arterial pulsation and finds a point below and lateral to the artery, usually just distal to the pectoral muscle fold.

b. Prepares the site for injection of the local anesthetic and puncture by swabbing with prepared antiseptic solution. Covers surrounding areas with sterile drapes, leaving only small area of injection and puncture uncovered.

c. Checks amount of local anesthetic to be injected as shown by nurse in syringe, or draws anesthetic into sterile syringe. Checks that no air is present and inserts needle intradermally and subcutaneously; injects. Makes sure to infiltrate the skin and the sheath of the vein on both sides of the vessel. Removes needle. Waits for area to become anesthetized.

7. When the entry area has become anesthetized performer makes sure that the entry site is optimally distended and prepares for puncture:

a. With "Seldinger" technique, performer proceeds as follows:

i) Chooses appropriate puncture needle as selected with polyetheline tubing attached. Performer may use a scalpel to make a small incision at the entry site (to facilitate entry of needle).

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ii) Performer has patient hold still. Attempts to penetrate the vein (at the incision if created), while palpating and fixing vein. Performer inserts needle in the direction of the planned route. For right subclavian entry directs needle above first rib and under clavicle at about 20°, medially backward and slightly upward. For right internal jugular vein directs needle just lateral to carotid pulse below the angle of mandible, at 45° with the skin.

iii) Pulls out the needle's inner stylus; attaches vena tube or syringe to needle; suctions back and checks needle entry by noting whether venous blood appears. Removes vena tube or syringe. May pull back on needle and reinsert or make other insertions until the needle tip is judged within the lumen of the vein. Removes tourniquet.

iv) May attach syringe with saline and/or anticoagulant to needle and flush entry site. With internal jugular vein may periodically flush with solution including anesthetic.

b. If a cut down is to be performed by a surgeon, performer indicates the entry site and waits while vein is exposed.

c. If performer is to do cut down of antecubital vein personally, proceeds as follows:

i) When area of incision is properly anesthetized, performer makes incision in skin where the vessel is to be exposed. Uses sterile scalpel to

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cut through skin and subcutaneous tissue and expose but not penetrate the vein. Has co-worker sponge away blood or does so personally and repeats as needed throughout procedure.

ii) Performer attempts to isolate and tie the vein. Uses small clamp or forceps to pick out and separate the vessel from surrounding nerves and blood vessels. If performer has difficulty doing this, may enlarge incision or make another; injects with additional anesthetic if needed.

iii) Performer cuts away the fatty tissue around the entry site in the exposed vessel using sterile surgical scissors.

iv) Once the vessel has been isolated performer may use suture thread to loosely tie it off from the other vessels, making it accessible for catheterization. Lifts up vessel with forceps and passes the thread under it. Performer ties (ligates) the vessel distally.

v) Performer makes a nick in the vein wall for insertion of catheter, using fine pointed sterile scissors. Is careful not to cut opposite wall or include a major part of the circumference of vein. May make a longitudinal incision.

vi) Performer uses appropriate forceps or other instrument to open the incision for insertion.

vii) Performer may insert a prepared tubular section,a teflon needle, or the catheter itself while raising and stretching the incision and introducing the needle or catheter.

viii) Flushes with saline and/or anticoagulant as described above.

ix) Introduces guide wire as described below.

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d. Performer may check position of needle at this point:

i) Performer uses syringe prepared with a small amount of the contrast solution. Checks that medium is appropriate. Connects syringe to the catheter.

ii) Positions the overhead fluoroscope unit over the patient; may have lights in room dimmed; activates the fluoroscope; adjusts technical factors or has this done.

iii) Performer has patient hold still. Injects a small amount of the solution into the vein for viewing location of needle.

iv) Locates site of entry and checks position of needle within vessel by viewing on TV monitor. Performer judges whether needle is correctly inserted in lumen of vessel rather than in an intramural or extravascular position by viewing on TV monitor and watching flow of test dose.

v) Adjusts position of needle to be sure that the catheter will be free to pass along the lumen of the vessel.

vi) With teflon needle performer removes stiff inner needle leaving teflon sheath in place. May advance sheath several inches into lumen of vessel in the direction of the route to be catheterized.

e. Performer inserts a curved tip safety guide wire into the needle or sheath and advances this into the vessel in the direction of the planned route for catheterization. May advance guide wire be-

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fore removing needle or sheath and introducing catheter.

f. Once the guide wire is inserted, performer withdraws the needle or sheath, compressing the vein to reduce the bleeding. Cleans blood off guide wire. Inserts the appropriate size catheter by threading the catheter over the guide wire and into the vein. May first use a catheter selected to dilate the vein.

8. Performer advances the catheter (with or without guide wire as a leader) under fluoroscopic control, as appropriate, to the right atrium:

   a. In advancing the catheter and guide wire, performer is careful not to force passage.
   b. If an obstacle is encountered, performer checks position using fluoroscopy, syringe, and small amount of contrast solution (as described above). Injects a small amount of contrast into the vein through the catheter; activates fluoroscope and views on the TV monitor. Determines problem and redirects guide wire or catheter as appropriate. Performer evaluates entry route if appropriate and may choose alternative route, or decides to terminate as described. Performer repeats appropriate steps for any new location after properly caring for initial site.
   c. With femoral route performer advances guide wire and catheter to the iliac vein, under fluoroscopic control.

      i) Performer may inject a dose of anticoagulant into the venous system.

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      ii) Performer injects test dose of contrast under fluoroscopic control as described above. Notes passage of contrast. Evaluates whether any thrombi will be encountered en route in iliac vein or inferior vena cava, whether the projected route is patent. If route is obstructed or emboli are found, removes catheter as described below, selects alternative route, and cares for puncture site.
      iii) If continuation is indicated, and if a catheter used to dilate vein has been introduced, performer reinserts guide wire until it reaches the proximal "dilator" tip. Performer then removes catheter while compressing wound, and threads the curved pigtail catheter over the guide wire while compressing the site.
      iv) Performer advances the catheter (with guide wire as leader if so decided) up the main iliac vein and into the inferior vena cava under fluoroscopic control. Then advances to the level of the right atrium.

   d. With left axillary, antecubital, right subclavian, or internal jugular approach, performer advances the catheter to the superior vena cava under fluoroscopic control and directs it down to the level of the right atrium.
   e. If performer judges that entry through site chosen cannot be properly accomplished, performer may decide to enter from an alternative route. If so, performer repeats appropriate steps for new location after caring for initial site.

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- f. If entry or placement again cannot be easily accomplished, performer may decide to terminate so as to avoid further trauma to vessels. If so, performer records as appropriate and informs staff. May arrange for rescheduling.
- g. Performer attaches syringe prepared with saline and/or an anticoagulant to catheter. Flushes catheter periodically to avoid clotting and to keep catheter clear.

9. Once the right atrium has been entered performer may proceed as follows:

   - a. Performer may have intra-atrial pressure read and recorded by attaching manometer to the catheter.
   - b. Performer may inject a test dose of contrast under fluoroscopic control as described above. Observes passage through the heart and main pulmonary artery. Evaluates whether any thrombi will be encountered.
   - c. Performer decides whether to advance catheter further to selected site for injection, or prepares for injection in right atrium.
   - d. Reflushes catheter.
   - e. Performer may decide to have cardiologist take over to negotiate the heart chambers.

10. If performer decides to advance catheter beyond the right atrium, manipulates catheter with or without guide wire as leader under fluoroscopic control:

   - a. Performer manipulates the catheter through the tricuspid valve. May use test dose of contrast to visualize valve.
   - b. May pass catheter and guide wire through tricuspid valve about 1 to 2 cm., hold the guide wire, and feed the catheter over the wire into the outflow of the right ventricle, pulmonic valve, and on to the main pulmonary artery.
   - c. Performer may take and record the pressure in the right ventricle before passing the catheter to the main pulmonary artery.
   - d. Performer moves the catheter tip beyond the ventricle as quickly as possible. Reflushes catheter.
   - e. Performer may find that the left or right pulmonary branch has been entered, depending on the route of entry. Unless selective pulmonary arteriography is to be done first, performer pulls back catheter until it is in the main pulmonary artery.
   - f. Throughout procedure performer checks with cardiac team on patient's condition. If there is any sign of unstable conditions, arrhythmia or fibrillation, performer has cardiologist take over at once with emergency care.
   - g. Once in the main pulmonary artery, performer attaches manometer and has blood pressure read and recorded. If pulmonary pressure is deemed high, performer decides against any injection of contrast in the right side of the heart.

11. Performer advances the catheter or pulls back so that it is properly placed for the first angiographic series, based on the area of interest. If not already done, performer removes guide wire. Reflushes catheter.

   - a. Has patient positioned for AP, PA, lateral, right anterior oblique or right posterior oblique projections as decided, depending on site, area, and side of interest. Makes sure proper (close)

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collimation to area of interest will be observed. Checks staff shielding.

b. Performer checks that materials are ready for pressure injection of the contrast solution and for serial filming. Checks that patient is properly immobilized, shielded and positioned. Checks coordination of injection with filming:

   i) Checks that the automatic injector (used for introduction of the contrast solution under pressure) is loaded with proper amount of medium in syringe; checks that syringe is attached to injector tubing. Attaches tubing to catheter. Checks that there is no air in the system.
   ii) Performer checks on or orders the rate and pressure setting for the entry force for the automatic injector. Considers the force of entry needed to inject the contrast medium into the vessel of interest given the technique, vessel, and other conditions involved.
   iii) Performer has overhead x-ray tube(s) (single or biplane) positioned for serial filming and magnification if appropriate; checks with the technologist the sequence of injections and sequence of program (the rate of speed, length of time and intervals selected).

c. Checks with anesthesiologist (if present) and/or ECG monitor or cardiac team to determine patient's condition.

d. Performer directs injection and filming:

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   i) Performer may enter control room. Has patient hold steady, if conscious, or awaits indication from anesthesiologist that respiration has been suspended.
   ii) Performer tells technologist when to start the automatic film changer(s) (to make sure of proper functioning) to take the series of preprogrammed radiographs. Once changer has started, performer activates the automatic injector.
   iii) Removes catheter tip from right ventricle at once if it was site of injection.
   iv) Performer has serial films processed at once.

e. While serial films are being processed, performer examines and talks to patient (if conscious) to evaluate how the patient has responded to the procedure and the injection. Detaches injector tubing;reflushes catheter. Evaluates any EKG changes during initial injection as possible contraindication for any additional injections

12. Performer looks at the first set of serial pulmonary angiograms on view boxes in sequence as soon as they are processed. Places biplane views together.

   a. Checks for technical quality, and notes whether any irregularities are due to artifacts or actual pathological or abnormal conditions, and whether the views are clear enough for medical interpretation. Performer may ask opinion of another radiologist.
   b. Determines whether the radiographs adequately demonstrate the vessels

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and structures being studied, and provide sufficient information about any pathology, blockage, or distortion of the flow, the presence of pulmonary embolism, the extent and location of any anomalies, malformation, the presence of thrombi, and other signs of abnormal structure or pathology.

c. Performer considers whether to inject additional contrast, repeat injection and filming with change in technical factors or patient position (such as for more oblique view). Performer may decide that the information suggests the need to selectively catheterize the right and/or left pulmonary artery or to extend further to a lobar segment.

d. In deciding whether to repeat examination or proceed with selective catheterization, performer considers the patient's condition, the contraindications, the information already supplied, and the urgency. May discuss with anesthesiologist, and/or cardiologist.

13. For main branch or subselective pulmonary arteriography, performer proceeds as appropriate:

a. Performer may order biplane seriography, magnification, spot filming as described, as appropriate for new site of injection. Orders appropriate amount of contrast, force and rate of injection based on area of interest to be studied. Orders the injection and filming to include the appropriate phases of circulation.

b. Performer repositions catheter under fluoroscopic control:

i) Reinserts guide wire until it reaches proximal end of catheter.

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ii) Manipulates assembly until catheter has entered right or left pulmonary artery.

iii) For reposition to opposite side, pulls assembly back into main pulmonary artery. May change curve of catheter using a different guide wire, and reposition in opposite side main branch.

iv) Performer may advance catheter tip into lower lobe segmental artery. Makes test injection to be sure that catheter is not occluding a small vessel, preventing normal blood flow.

c. Allows appropriate elapse of time between injections for patient to respond optimally.

d. Before additional injections, change of position, change in technical factors, performer reviews decisions on injection pressure, amount of contrast, rate and speed of serial programs; indicates what is needed to staff and repeats steps as appropriate.

e. Performer may decide to carry out spot filming in conjunction with injections, especially in study of emboli. If so, performer decides what spot films to make while viewing flow of contrast on TV monitor:

i) Performer may collimate fluoroscopic tube to the area of interest.

ii) For magnification raises spot film device before activating exposure control.

iii) Activates spot film attachment and x-ray foot pedal as appropriate.

iv) If cassette attachment, may have technologist remove cassette as spots are snapped and

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insert additional cassettes, or does so personally.

f. Performer reflushes the catheter periodically with saline and/or anticoagulant. Maintains check on condition of patient.
g. Repeats relevant steps for repeat or additional angiograms of other side or segments as decided and as described above until satisfied that the angiograms are technically adequate to demonstrate the areas and conditions under study and to provide sufficient information to make possible a competent medical interpretation or a surgical decision.

14. Throughout procedure performer checks with cardiac team on how the patient is responding. May decide to assist in providing emergency care:

a. Performer helps determine the severity of patient's reaction by listening for heartbeat, respiration; may check blood pressure; may take EKG reading using equipment on emergency cart.
b. If patient has a severe reaction to the procedure or contrast medium, such as cardiac arrest, arrhythmia, anaphylactic shock (exaggerated negative reaction to the foreign substance), bronchospasm or laryngospasm (stricture of bronchial tubes or larynx), hypotension (drop in blood pressure), cyanosis (bluish discoloration due to excessive concentration of reduced hemoglobin in blood), urticaria (vascular skin reaction), or violent sneezing, performer proceeds at once to assist with emergency life support or measures to control the reaction:

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i) May help administer oxygen or air using oxygen tank and mask or ambu bag; may clear airway using finger or tongue blade.
ii) May help to establish an airway by removing any dentures and, using a laryngoscope (to view larynx) insert an endotracheal tube.
iii) May apply closed chest cardiac massage.
iv) Depending on ECG results may apply defibrillator by selecting watt seconds, applying and raising watt seconds until effective.
v) Depending on ECG results, may administer a prepared intracardial injection of a heart stimulant.
vi) May administer IV infusion; may order and administer a corticosteroid, an antihistamine or atropine.
vii) May administer Valium in solution through the injection tubing.

c. Performer helps decide whether the reaction is sufficiently controlled to proceed.

i) If decision is to terminate procedure, notifies appropriate medical staff; has patient transported to appropriate location.
ii) Records patient's reactions and what was done on patient's chart. If appropriate, makes sure patient is informed of the type of drug that caused the reaction or explains to patient that he or she is allergic to the contrast solution (i.e. iodine-based solution).

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d. If performer judges that patient displays a strong (but not emergency) allergic reaction:

   i) Performer may order and administer a corticosteroid, an antihistamine or atropine.
   ii) Records reaction and what was done. Explains if appropriate to patient that he or she is allergic to the contrast solution.

e. If performer notes any signs of arterial or venous spasm, may inject an anticoagulant, and/or apply hot packs at once to avoid thrombotic occlusion.

f. If patient displays coughing during selective arterial injection, performer reassures patient that this is natural and enlists patient's cooperation in staying as motionless as possible during filming.

15. Performer decides when the radiographic examination is completed based on information on the angiograms and the patient's condition. Informs anesthesiologist (if present), technologist, cardiac team and other staff that procedure is to be terminated.

   a. Performer returns to the patient. If patient is conscious, performer reassures patient and explains what will happen next.
   b. If appropriate may repeat pressure readings when pulling catheter back through right ventricle and/or atrium.
   c. Removes any connecting tube or syringe from catheter.
   d. Performer gently and slowly withdraws the catheter. Manipulates catheter by turning and pulling carefully, taking care not to injure the vessel or enlarge the wound at the entry point.

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   e. Performer compresses the vessel proximal to or at the puncture site lightly with the fingertips and/or sterile gauze for an appropriate amount of time. Checks that there is no hematoma at the site.
   f. If cut down has been performed performer may decide to suture or ligate the vein:

      i) Performer unties the vessel and prepares to suture the incision. May indicate to co-worker the suture material and needle size selected. May inject local anesthetic, flush with saline.
      ii) Performer threads suture needle of size chosen with suture material selected. Sews opening of incision using appropriate number of stitches to close wound. Makes sure that full thickness of subcutaneous tissues and skin are stitched back superficially to the vein.

   g. If patient has had jugular or axillary vein puncture, has patient sit up for two to three hours to reduce venous pressure.
   h. Performer applies or orders pressure dressing to be kept in place appropriate amount of time.
   i. Performer may order fluids to be given intravenously or by mouth. May order bed rest for appropriate period while patient recovers from effects of procedure.
   j. Arranges to have puncture site examined regularly over the next few hours and any problems reported at once. Informs patient or attending staff to report further oozing of blood or swelling.

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k. Performer may order careful observation of patient including vital signs, urinary output, and skin care. May order tests, fill out order forms. May order medication. l. May order delayed urogram and/or chest film for appropriate amount of minutes after last injection. m. Has appropriate sanitary clean up procedures carried out. n. If requested, calls surgeon or clinician and reports preliminary results and findings. 16. Performer records impressions of procedure on patient's chart: a. Preliminary findings. b. How patient tolerated procedure. c. Any special nursing follow-up recommended, tests, delayed films ordered, records and observation required, medication, later studies ordered. d. May sign chart, requisition sheet or order forms.	

TASK DESCRIPTION SHEET

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1. What is the output of this task? (Be sure this is broad enough to be repeatable.)

Pt. examined, reassured; decisions made on going ahead, route, technique, site of puncture, contrast medium, type of injection, filming; preparatory orders given; site anesthetized; artery punctured; guide wire and catheter advanced to thoracic aorta with fluoroscopic control; bronchial artery orifice probed, entered; test dose given; injection and filming coordinated; arteriograms reviewed; selective catheterization continued until final approval; emergency care given; instruments removed; site compressed; orders for after care, tests, delayed films, medical impressions recorded.

2. What is used in performing this task? (Note if only certain items must be used. If there is choice, include everything or the kinds of things chosen among.)

X-ray requisition form; pt.'s medical chart, prior films, scans, pen; view boxes; sterile tray with antiseptic, saline, anticoagulant, local anesthetic, swabs, tape, scissors, gauze, pressure dressings, syringes, puncture needle, scalpels, guide wires, catheters; automatic injector; iodine-based contrast; x-ray table; serial changer(s); fluoroscope, TV monitor; videotape device; emergency cart; sterile gown, gloves, drape; shielding

3. Is there a recipient, respondent or co-worker involved in the task? Yes...(x) No...( )

4. If "Yes" to q. 3: Name the kind of recipient, respondent or co-worker involved, with descriptions to indicate the relevant condition; include the kind with whom the performer is not allowed to deal if relevant to knowledge requirements or legal restrictions.

Any pt.; authorized adult; attending MD; radiologist; anesthesiologist; radiologic technologist; nurse

5. Name the task so that the answers to questions 1-4 are reflected. Underline essential words.

Conducting selective bronchial arteriography of any pt. by examining, reassuring pt.; obtaining consent; deciding on route, technique, prior preparation, whether to go ahead, type of injection, filming, magnification, subtraction; injecting local anesthetic; making puncture; advancing catheter, guide wire under fluoroscopic control to aorta; catheterizing bronchial branches under fluoroscopy and test injections; coordinating injection of contrast and filming; evaluating; deciding on continued selective catheterization as appropriate; providing care; removing instruments; ordering after care, tests, delayed films; recording orders, medical impressions.

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Performer receives the x-ray requisition form and medical chart of a patient scheduled for selective bronchial arteriography (radiographic contrast study of the bronchial arteries by means of selective catheterization) prior to the procedure, such as on the previous day or evening.

1. Performer reads the patient's medical history and requisition form to review the case or to become familiar with materials seen earlier in consultation, in order to make decisions about the conduct of the radiographic study and to check on the reuest of the referring physician:
   a. Performer notes the patient's age, sex, weight, height, the name of the referring clinician. Notes the nature and location of the suspected pathology or symptomology, such as vascular lesions, evidence of vascular occlusive disease, soft tissue tumors, stenosis, aneurysms or congenital anomalies.
   b. Performer notes the purpose of the requested study such as for delineating and evaluating systemic collateral [illegible]tion to the lungs, [illegible] of chronic lung dise[illegible] for diagnostic informa[illegible] on suppurative pulmonary disease, organizing pneumonia or neoplasm. Notes

OK-RP;RR;RR

6. Check here if this is a master sheet..(X)

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whether bilateral study is indicated or side of interest.

c. Performer reviews the diagnostic information already obtained, including any prior radiographs, radioisotope scans, pulmonary function studies, results of clinical tests, lab tests, EKG, (ECG) and vital signs.

d. Performer notes relevant prior history such as prior incidents of vascular constriction, removal of any section of the vascular system, grafts and their sites, history of atherosclerosis, heart disease, renal, pulmonary, or liver disease, history of allergies or indications of allergy to iodine-based contrast media. If already done, notes results of allergy test, clotting time tests. Notes stage of female patient's menstrual cycle, any possibility of pregnancy, whether on oral contraceptive. Notes whether patient has an infectious or communicable condition.

e. Notes whether prior orders have been given to improve patient's clinical condition; if so, notes progress.

f. Performer notes recommendations on catheterization such as site and route of entry and use of equipment and materials. Notes recommendations on use of general or local anesthesia.

g. Checks to see whether patient or authorized adult has signed consent for procedure. If not, may decide to obtain personally before sedation.

h. Performer may discuss case with referring clinician or specialist to obtain additional information. May arrange for attending physician and/or anesthesiologist to accompany performer in examination of patient on day prior to the procedure.

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2. Performer visits patient and any authorized adult at bedside or in appropriate location. May be accompanied by clinician, anesthesiologist, or appropriate specialist.

   a. Performer greets patient and/or authorized adult and explains that a brief examination will occur. If any colleagues are with performer, performer introduces them.

   b. Performer reads patient's chart. Notes any new clinical developments, response to care or medication. May ask patient or accompanying adult about symptoms and allergies. Examines the patient for relevant symptoms and general state. Reassures and answers questions. If not already done, performer determines whether there is any possibility of pregnancy in the case of a female patient, whether patient has been taken off any oral contraceptive.

   c. Performer considers whether there have been changes in the patient's condition since the decision was made to do the procedure, and considers whether there are contraindications to going ahead with the procedure. May confer with specialist or clinician; discusses patient's current condition. Decides whether to proceed, cancel or delay procedure based on assessment of patient's current condition and any discussion.

   d. If performer decides to proceed, examines femoral arterial pulses to determine best vascular approach and entry site.

      1) Notes strength and expansive nature of the pulsations, presence of bruits (murmurs), presence of grafts, presence and

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location of ischemic symptoms, local infection. Reviews recommendations.

ii) Performer considers the condition of the pulses, side, and location of the pathology, areas of interest, clinical and surgical history, age of patient and nature of symptoms.

iii) Selects side and puncture site considering condition of area, patient's age, and the side of interest. Avoids puncture site where there is severe atherosclerotic involvement, scars or grafts. Favors right femoral artery for right bronchial artery and left femoral for left bronchial unless one femoral pulse is weak.

iv) Performer examines and records presence and character of pulses at, and distal to, the artery to be punctured.

e. If performer decides not to have procedure done, may discuss with clinician. Records reasons for cancellation and any recommendations for alternative procedure on patient's chart. Informs staff of cancellation and discusses with patient.

f. Performer may decide to delay procedure, have patient undergo treatment to improve clinical condition, such as treatment for blood pressure, anemia, infectious condition, or malnutrition. Discusses as appropriate and has orders given for care of patient. If patient has been on anticoagulant therapy, may order cessation until prothrombin and/or clotting times are within normal levels. May order cessation of oral contraceptive if not already done. With emergency patient may determine whether delay is contraindicated.

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g. If performer decides to proceed and a consent for the procedure has not been obtained, performer may explain to the patient or guardian in comprehensible language what will occur in the procedure, its purpose, and the dangers to the patient involved. Performer explains the alternatives; answers questions.

i) When the performer is sure that the patient understands the risks, asks the patient for signature on consent form and checks that it is properly signed.

ii) If a guardian is to sign, performer explains to the individual as appropriate.

iii) If a consent is not agreed to, performer postpones procedure until it is obtained. May discuss with appropriate physician or individuals and/or with patient. Does not proceed unless consent is obtained.

h. Performer decides on the type of equipment to use based on institutional facilities and nature of study:

i) May order serial single or biplane cassette changer, videotape, magnification technique, depending on area of interest, purpose of study and nature of pathology. May indicate that subtraction films will be prepared.

ii) May decide on manual and/or automatic pressure injection equipment.

iii) If magnification is to be used, orders x-ray tube with an ap-

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propriately small fractional focal spot and a table capable of adequate elevation. Orders degree of magnification.

iv) May indicate types, sizes and length of catheter. May specify type of preformed tapered-end, curved catheter with deflector assembly, whether closed-end, with side holes. May specify type of safety guide wire, floppy wire, size and type of needle, type of contrast solution. May order rotating x-ray table.

i. Performer may make preliminary decisions on care of patient:

i) Decides on use of general and/or local anesthetic. May discuss with anesthesiologist. If a general anesthetic is to be administered, performer arranges to have staff ready at the appropriate time.

ii) Performer makes final decisions on prior preparation of the patient such as sedation, period for withholding of food and/or drink, hydration, use of prior IV drip, shaving of entry site, prior administration of antihistamine, medications to deal with problems of blood clotting. May order ECG monitoring.

j. Performer records orders as appropriate so that patient and equipment can be prepared and staff assigned. May sign requisition; places for scheduling.

k. Reviews with patient the procedures that will occur.

3. Just prior to the time for which the procedure is scheduled, the performer reviews all the relevant medical information and the patient's chart. Reviews relevant prior radiographs. Notes any new developments.

a. Performer greets patient in examination room. May question about symptoms; reassures and explains what will occur.

b. Performer checks that all prior preparatory procedures have been carried out.

i) Checks report on electrolyte levels, blood clotting time, vital signs.

ii) Checks that any orders for hydration, starting of IV infusion, prior administration of medication or sedation have been carried out, and at appropriate time. If not, arranges to have these done and/or procedure delayed.

c. Performer examines puncture site to review earlier decision. Makes sure no swelling or tenderness is present. Considers alternative puncture site if appropriate. Indicates puncture site to staff.

d. Performer may order scout film(s) of chest as appropriate for single or biplane views. Makes sure proper shielding is being used.

i) Performer places the processed scout films on view boxes and examines as soon as they are ready. Performer considers whether the areas of interest are visible, whether the technique is satisfactory, and whether the position of the patient is correct.

ii) If the scouts are not satisfactory, performer indicates the needed changes in technique or

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in the patient's position to the radiologic technologist.

e. Performer considers whether patient's current condition presents any contraindications to going ahead with the procedure. May have clinician or specialist called; discusses patient's condition and any alternative steps. Decides whether to proceed or not based on need, evaluation of patient's condition and contraindications.

f. If performer decides not to proceed, records reasons and any recommendations on patient's chart. Informs appropriate co-worker of cancellation and has patient returned to room. If appropriate, orders rescheduling of patient or scheduling for alternative procedure.

g. If patient is pediatric patient or if general anesthesia has been suggested for adult, performer may reconsider whether general anesthesia is still warranted; may decide to order if patient's behavior and condition suggest the need. If general anesthesia is to be carried out, performer discusses with anesthesiologist when it is to be administered and plans to coordinate with anesthesiologist.

h. May order sedation and/or IV drip if appropriate and not already administered. Has puncture site and possible alternative site shaved and prepared.

i. Performer may explain or demonstrate use of equipment to a child to allay fears and enlist cooperation; answers questions. Explains that patient will be asked to hold still from time to time. Indicates what will happen, what pain might be experienced, and what cooperation will be needed. Stresses need to

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maintain positions when ordered. May indicate to patient to report any pain during placement of catheter or test injection (as indication of entry into intercostal artery). Indicates that patient may feel the need to cough when bronchial arteries are injected.

4. Performer makes final decisions on technique and surgical procedure:

a. Decides on or checks sizes of needles, type and size of catheter, guide wires. Decides on type of contrast solution, use of automatic or manual injection, use of biplane or single plane serial changer, magnification, videotape, subtraction films.

b. Has technical factors set for fluoroscopy. May have videotape equipment set up for use.

c. If a biplane study is involved, orders desired projections and/or angulation. Indicates whether biplane films will be taken simultaneously or sequentially.

d. Performer decides on program for seriography. Informs technologist of the number of films to be taken, the per-second intervals, and the number of series anticipated. Has equipment checked.

e. Performer may decide to start with thoracic aortogram to facilitate location of bronchial arteries.

f. If performer decides on use of magnification technique with serial filming, has technologist adjust height of table and x-ray tube(s) so that the ratio of the focal-film distance (FFD) to the focal-object distance (FOD) (focal spot to film distance divided by focal spot to table distance) is equal to the desired magnification. Has grid removed.

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g. If general anesthesia is to be administered, indicates to anesthesiologist when procedure is to start and allows for appropriate timing.

h. Informs appropriate co-workers of decisions so that patient and materials can be prepared.

i. Has patient prepared on a table that permits rotation of the patient to either side for use during procedure.

5. Performer returns to patient in procedure room when informed that patient and equipment are ready:

a. Checks whether patient has been properly shielded, immobilized, and prepared for sterile puncture procedure. If not acceptable, indicates the needed adjustments. May decide to immobilize personally.

b. Checks sterile tray prepared for procedure. Requests any missing objects.

i) Performer checks that appropriate needle and catheter sizes and lengths are available and catheters preformed as appropriate. Checks safety guide wires. May bend catheters personally. May check deflector assembly.

ii) Checks that syringes with saline, local anesthetic and anticoagulant solution are prepared, that syringes with contrast medium, for hand and automatic injection (if ordered), are ready.

iii) Checks appearance of contrast medium to be sure there is no chemical deterioration; checks amount.

c. If patient has special equipment such as IV or indwelling catheter, performer makes sure that these are being monitored. May check that EKG monitoring equipment is present. Checks that emergency cart is present.

d. Checks that seriography equipment is ready for use, that technical factors are set for seriography and fluoroscopy, and that any equipment for pressure injection is checked and ready for use.

e. Dons protective lead garments and sterile gown and gloves when appropriate. Checks staff shielding.

f. If patient is coherent, performer explains what will be done. Answers patient's questions as appropriate. Reassures patient and does so as deemed needed throughout procedure.

g. If general anesthesia is to be administered, checks with anesthesiologist to be sure that the patient is ready for procedure to begin.

6. Performer proceeds to prepare the puncture site in femoral artery using sterile technique:

a. Has patient lie supine on table with legs positioned for access on side of interest below the inguinal ligament, as high as possible, but allowing for later compression of the vessel proximal to the puncture site.

b. Performer locates the vessel for puncture visually and/or by feeling for arterial pulsation in the location selected. May choose more palpable position in vessel allowing for later compression.

c. Prepares the site for injection of the local anesthetic and puncture by swabbing with prepared antiseptic solution. Covers surrounding areas with sterile

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drapes, leaving only small area of injection and puncture uncovered.

d. Checks amount of local anesthetic to be injected as shown by nurse in syringe, or draws anesthetic into sterile syringe. Checks that there is no air, and inserts needle intradermally and subcutaneously; injects. Makes sure to infiltrate the skin and the sheath of the artery on both sides of the vessel. Removes needle. Waits for area to become anesthetized.

7. Performer proceeds with selective "Seldinger" catheterization as follows:

   a. If patient is conscious, explains when patient is to hold steady for puncture.
   b. Performer feels for the arterial pulse by palpating with fingers. Makes an incision or nick through the skin with a sterile scalpel at the site where the needle and catheter will enter.
   c. Performer inserts puncture needle tip (appropriately sized hollow needle with sharp cutting inner stylus) or teflon needle tip (equipped with stylet and teflon sheath) into the incision while palpating and fixing the artery. Performer angles needle to enter along the lateral side of the vessel with the tip directed along the course of the artery. May attempt to enter only the anterior arterial wall.
   d. Performer pulls out the needle's inner stylus and withdraws the needle slowly until a characteristic "pop" is felt and a vigorous jet of arterial blood is obtained. May pull back on needle, reinsert, or make other incisions until artery is successfully entered.

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      i) With teflon needle performer removes stiff inner needle leaving teflon sheath in place.
      ii) May advance needle or sheath several inches into lumen of vessel in the direction of the route to be catheterized.

   e. Performer inserts a curved tip safety guide wire into the needle or sheath and advances this into the vessel in the direction of the planned route for catheterization. May advance guide wire before removing needle or sheath and introducing catheter.
   f. Once the guide wire is inserted, performer withdraws the hollow needle or sheath, compressing the artery to reduce the bleeding. Cleans blood off guide wire. Inserts the appropriate size catheter by threading catheter over the guide wire and into the artery.
   g. Performer decides whether to advance the catheter using the guide wire as a leader or to remove guide wire. If so decided, removes guide wire.
   h. Performer may check position of catheter at this point:

      i) Performer uses syringe prepared with a small amount of the contrast solution. Checks that medium is appropriate. Connects syringe to the catheter.
      ii) Positions the overhead fluoroscope unit over the patient; may have lights in room dimmed; activates the fluoroscope; adjusts technical factors or has this done.
      iii) Performer has patient hold still. Injects a small amount of the solution into the artery

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for viewing location of catheter tip and guide wire.

   iv) Locates site of entry of catheter and checks position of catheter within vessel by viewing on TV monitor. Performer judges whether catheter is correctly inserted in lumen of vessel rather than in an intramural or extravascular position by viewing on TV monitor and watching flow of test dose.
   v) Adjusts position of guide wire and/or catheter to be sure that the catheter is free to pass along the lumen of the vessel.
   vi) If performer judges that entry through the femoral site chosen cannot be properly accomplished, performer may decide to enter from the opposite artery. If so, performer repeats appropriate steps for new location after caring for initial site.
   vii) If entry or placement cannot be easily accomplished, performer may decide to terminate so as to avoid further trauma to vessels. If so, performer records as appropriate and informs staff. May arrange for rescheduling.

i. Performer advances the guide wire and/or catheter to the aortic bifurcation and then into the descending aorta using fluoroscopic control:

   i) In advancing the catheter and/or guide wire, performer is careful not to force passage.
   ii) If an obstacle is encountered, performer checks position using fluoroscopy, syringe, and small amount of contrast solution (as described above). Injects a small amount of contrast into

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the artery through the catheter; activates fluoroscope, and views on the TV monitor. Determines problem and redirects guide wire or catheter as appropriate. Performer evaluates entry route if appropriate and may choose opposite side or termination as described. Performer repeats appropriate steps for any new location after properly caring for initial site.

   iii) For thoracic aortography, advances catheter so that tip is at the midpoint of the ascending aorta. May position tip of catheter above valve if appropriate. If so, is careful not to enter a coronary artery.
   iv) For first stage of selective bronchial arteriography, advances catheter assembly to the region of the carina.

j. Performer checks location of catheter using test dose and fluoroscopic control, as described. Adjust position as appropriate.
k. If not already done, performer removes guide wire.
l. Performer attaches syringe to catheter prepared with saline, anticoagulant. May include local anesthetic (if patient is not under general anesthesia). Flushes periodically to avoid clotting, to keep catheter clear and to minimize pain.

8. If performer is to begin with thoracic aortography, prepares for immediate injection of contrast and filming:

   a. May decide on rapid manual or automatic injection of thoracic aorta with videotaping or seriography.

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b. Has patient positioned as appropriate for single or biplane views and seriography, or videotape recording from TV image of fluoroscopic examination.

c. Chooses amount of contrast solution based on size of patient and optimal cumulative amount for the procedure. Selects minimum amount necessary.

d. If pressure injection is to be done by hand, performer prepares or checks syringe with the iodine-based, aqueous contrast solution for correct quantity and no air.

e. If pressure is to be done by automatic injector, performer prepares to coordinate injection with filming:

   i) Checks that the automatic injector is loaded with proper minimum amount of medium in syringe; checks that syringe is attached to injector tubing. Attaches tubing to catheter. Checks that there is no air in system.

   ii) Performer determines, sets, or orders the rate and pressure setting for the entry force of the automatic injector. Considers the force of entry needed to inject the contrast medium into the vessel, given the vessel and other conditions involved.

f. Performer has overhead x-ray tube(s) positioned for serial filming and checks with the technologist the sequence, rate of speed, and length of time selected, or positions fluoroscope unit for viewing on TV monitor.

g. Has patient hold steady, if conscious, or awaits indication from anesthesiologist that respiration has been suspended.

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h. With serial filming, performer tells technologist when to start serial cassette changer(s), and activates automatic injector or injects by hand, quickly, with syringe attached to catheter.

i. With fluoroscopy and videotape, activates automatic injector or injects by hand. Activates fluoroscope and videotape recorder and views flow of contrast on TV monitor. Moves table as appropriate for optimal viewing of the various bronchial arteries and their sites.

j. Has serial aortograms processed at once.

k. While aortograms are being processed, performer examines and talks to patient (if conscious) to evaluate how the patient has responded to the procedure and the injection.

   i) Reflushes catheter.

   ii) If ECG is being monitored, evaluates any changes during initial injection as possible contraindication for any additional injections.

l. Performer has videotape record played back on TV monitor, "freezing" views of interest for further study, or looks at aortograms on view boxes. Places any biplane views together.

m. Performer evaluates aortograms or video images to determine the number of sites of origin of the bronchial arteries on each side or on the side of interest. Decides on a sequence for probing for orifices and catheterization.

9. For selective bronchial arteriography, performer advances the catheter tip just distal to the origin of the left subclavian artery and gently rotates

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catheter while advancing and/or retracting catheter to enter the first bronchial artery on the first side of interest.

a. Performer may view on TV monitor; may rotate patient.
b. Keeps catheter tip perpendicular to aortic wall, directed posteriorly or as appropriate.
c. Performer notes entry by viewing on monitor and feeling characteristic "catching" or "click" sensation.
d. If performer does not find orifice by probing in standard manner and/or by reviewing aortograms or video playback, performer may do a systematic search, gradually turning, advancing, and withdrawing catheter until internal surface of aorta at level of fifth and sixth thoracic vertebrae has been fully explored.

10. Once the first bronchial branch has been entered, performer prepares for test injection to determine that a bronchial artery and not an intercostal artery has been entered.

    a. Attaches syringe with contrast to catheter if not already done.
    b. Instructs patient if conscious to report any pain as indication of entry into intercostal artery.
    c. Injects a very small amount of contrast while viewing on TV monitor.

        i) Performer notes whether the opacified artery indicates correct entry.
        ii) Notes whether patient is having any ipsilateral back pain or painful burning in chest wall. If so, immediately withdraws catheter back into aorta or flushes with anesthetic and withdraws catheter.
        iii) Performer notes whether patient coughs without pain as indication of proper entry.
        iv) If performer notes that blood flow has been delayed or obstructed, performer repositions catheter at once to permit free flow of blood in catheterized artery.

11. When catheter placement has been judged appropriate, performer prepares for injection and filming:

    a. Performer decides on amount of contrast to inject based on the size of the vessel, rate of flow observed on test injection; and number of orifices, test injections, and angiographic injections contemplated. Selects minimum amount compatible with need for information.
    b. Performer checks or sets up for single or biplane seriography, and/or pressure injection at low pressure setting, and magnification, as described earlier. Checks collimation and shielding. Decides on program for seriography, including timing of injection to provide for prior plain films for subtraction masks, and proper elapse of time to provide filming of appropriate phase. Informs technologist of the number of films to be taken, the per-second intervals, and the number of series anticipated.
    c. Performer orders filming in frontal, lateral and/or oblique positions as decided, with patient supine and table positioned as appropriate.
    d. Performer may inject local anesthetic prior to injection of contrast.

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e. When injecting, performer has patient hold steady (if conscious), and tells technologist when to start the automatic film changer to take the series of pre-programed radiographs in coordination with the injection of the contrast solution. Once changer(s) start, allows for filming without injection for subtraction masks if appropriate.

  - i) Performer reflushes catheter with saline, anticoagulant and anesthetic after filming.
  - ii) Performer may withdraw the catheter tip and permit it to rest freely in aorta.
  - iii) Has serial bronchial arteriograms processed at once.
  - iv) Checks on condition of patient.

12. Performer looks at the first set of serial arteriograms on view boxes in sequence as soon as they are processed. Places biplane views together.

  a. Checks for technical quality and notes whether any irregularities are due to artifacts or actual pathological or abnormal conditions, and whether the views are clear enough for medical interpretation. Performer may ask opinion of another radiologist.
  b. Performer notes whether radiographs demonstrate bronchial arteries not recognized on the TV monitor.
  c. If subtraction has been ordered, performer selects the radiographs for subtraction technique. Performer reviews subtraction films when ready. May order second-order subtractions if image is not deemed sharp enough. Repeats additional review as required.
  d. Determines whether the angiograms adequately demonstrate the vessels and structures being studied, and provide sufficient information about any pathology, blockage, or distortion of the flow, the extent and location of any anomalies, malformation, the presence of aneurysms, and other signs of abnormal structure or pathology.

    - i) Performer considers whether the catheter tip should be placed for injection at a different location along a common bronchial vessel; considers whether injection should be repeated for additional projections; considers whether further search should be made, such as at a lower level, for other bronchial arteries of the same lung; considers whether bilateral study is indicated.
    - ii) Considers the patient's condition, the contraindications, the information already supplied, and the urgency. May discuss with anesthesiologist and/or clinician.

13. If performer decides on additional injection sites, positions, and/or vessels to be entered, repeats appropriate steps as described above.

  a. Performer continues to probe for each bronchial artery to be injected as described earlier, using the most typical anatomical locations as guide, or evidence from aortograms or videotape, or follows systematic probing as described.
  b. For each orifice makes small test injection to check for proper placement in a bronchial artery. Removes catheter at once upon any

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sign of pain or occlusion of the vessel by the catheter.

c. Injects a small quantity of local anesthetic, saline and anticoagulant before and/or after each injection.
d. For additional injections, change of position, change in technical factors, performer reviews decisions on injection pressure, amount of contrast, rate and speed of serial programs; indicates what is needed to staff and repeats as appropriate.
e. Allows appropriate elapse of time between injections for patient to respond optimally.
f. If EKG is being monitored, evaluates any changes during injection as possible contraindication for any additional injections.
g. May decide to provide emergency care at any time throughout procedure if patient shows signs of adverse reactions. If performer notes any signs of arterial spasm, may inject an anticoagulant, and/or apply hot packs at once to avoid thrombotic occlusion.
h. Between individual injections performer may withdraw the catheter from the artery and allow it to lie in the aorta.
i. Performer repeats steps for repeat or additional arteriograms as described above. Repeats review and evaluation as described until satisfied that the angiograms are technically adequate to demonstrate the areas and conditions under study and to provide sufficient information to make possible a competent medical interpretation.

14. Performer decides when the radiographic examination is completed based on information on the angiograms and the patient's condition. Informs anesthe-

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siologist (if present), technologist, and other staff that procedure is to be terminated.

a. Performer returns to the patient. If patient is conscious, performer reassures patient and explains what will happen next.
b. Removes any connecting tube or syringe from catheter.
c. Performer gently and slowly withdraws the catheter. Manipulates catheter by turning and pulling carefully, taking care not to injure the vessel or enlarge the wound at the entry point.
d. Performer compresses the vessel proximal to or at the puncture site with the fingertips and/or sterile gauze for an appropriate amount of time.

   i) Does not totally occlude the artery. Checks that there is a pulsation distal to the puncture site and no hematoma at the site.
   ii) May have a staff member continue the compression for the time needed. Makes changeover so as to maintain pressure by withdrawing own hands from under those of the relieving staff member once they are in place.

e. Performer applies or orders pressure dressing to be kept in place appropriate amount of time.
f. Performer may order fluids to be given intravenously or by mouth. May order bed rest for appropriate period while patient recovers from effects of procedure.
g. Arranges to have puncture site, extremities and arterial pulses examined regularly over the next few hours and any problems reported at

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once. Informs patient or attending staff to report further oozing of blood or swelling. h. Performer may order careful observation of patient including vital signs, urinary output, and skin care. May order tests, fill out order forms. May order medication. i. May order delayed urogram and/or chest film for an appropriate amount of minutes after last injection. j. Has appropriate sanitary clean up procedures carried out. k. If requested, calls clinician and reports preliminary results and findings. 15. Performer records impressions of procedure on patient's chart: a. Preliminary findings. b. How patient tolerated procedure. c. Any special nursing follow-up recommended, tests, delayed films ordered, records and observation required, medication, later studies ordered. d. May sign chart, requisition sheet or order forms.	

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1. **What is the output of this task? (Be sure this is broad enough to be repeatable.)**

Pt. examined, reassured; decisions made on going ahead, route, technique, site of puncture, contrast medium, type of injection, filming; preparatory orders given; site anesthetized; artery punctured; guide wire and catheter advanced under fluoroscopic control; injection and filming coordinated; angiograms reviewed; selective catheterization continued until final approval; emergency care ordered; instruments removed; site compressed; orders for after care, tests, urogram, medical impressions recorded.

2. **What is used in performing this task? (Note if only certain items must be used. If there is choice, include everything or the kinds of things chosen among.)**

X-ray requisition form; pt.'s medical chart, prior films, scans; pen; view boxes; sterile tray with antiseptic, saline, anticoagulant, swabs, tape, scissors, gauze, pressure dressings, local anesthetic, syringes, puncture needle, scalpels, guide wires, catheters; automatic injector; iodine-based contrast; x-ray table; film changer(s); fluoroscope, TV monitor; stereo viewer; tourniquet; emergency cart; sterile gown, gloves, drape; shielding

3. **Is there a recipient, respondent or co-worker involved in the task? Yes...(X) No...( )**

4. **If "Yes" to q. 3: Name the kind of recipient, respondent or co-worker involved, with descriptions to indicate the relevant condition; include the kind with whom the performer is not allowed to deal if relevant to knowledge requirements or legal restrictions.**

Any pt.; authorized adult; attending MD; radiologist; anesthesiologist; surgeon; radiologic technologist; nurse

5. **Name the task so that the answers to questions 1-4 are reflected. Underline essential words.**

Conducting selective thyroid angiography of any pt. by examining, reassuring pt.; obtaining consent; deciding on site, route, technique, prior preparation; deciding whether to go ahead, type of injection, filming; injecting local anesthetic; making puncture; advancing catheter and guide wire under fluoroscopic control; coordinating injection of contrast and filming; evaluating angiograms; deciding on selective catheterization as appropriate; continuing; ordering emergency care; removing instruments; ordering after care, tests, delayed films; recording orders, medical impressions.

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Performer receives the x-ray requisition form and medical chart of a patient scheduled for selective thyroid angiography (radiographic contrast study of the thyroid and parathyroid glands, their arteries and veins, by means of selective catheterization) prior to the procedure, such as on the previous day or evening.

1. Performer reads the patient's medical history and requisition form to review the case or to become familiar with materials seen earlier in consultation, in order to make decisions about the conduct of the radiographic study and to check on the request of the referring physician:
   a. Performer notes the patient's age, sex, weight, height, the name of the referring clinician or surgeon. Notes the nature and location of the suspected pathology or symptomatology such as lesions of the gland(s), congenital anomalies, tumor or mass in the gland(s) or vascular circulation. Notes whether a bilateral study is involved.
   b. Performer notes the purpose of the requested study such as for information for use prior to or after surgery, preliminary or supplementary diagnosis, to visualize large

OK-RP; RR; RR

6. Check here if this is a master sheet..(X)

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or small vessels, tumors, to evaluate structural changes.

c. Performer reviews the diagnostic information already obtained, including any prior radiographic studies, radioisotope scans, results of clinical, lab, and sensitivity tests, ECG, vital signs, clotting time tests, tests of venous samples.

d. Performer notes relevant prior history such as prior incidents of vascular constriction, removal of any section of the vascular system, grafts and their sites, history of atherosclerosis, heart disease, hypertension, renal, pulmonary, or liver disease, thrombosis, abnormal bleeding tendency, anticoagulation therapy, history of allergies or indications of allergy to iodine-based contrast media. Notes stage of female patient's menstrual cycle, any possibility of pregnancy, whether on oral contraceptive. Notes whether patient has an infectious or communicable condition, especially local infection at possible puncture site.

e. Notes whether prior orders have been given to improve patient's clinical condition; if so, notes progress.

f. Performer notes recommendations on catheterization such as site and route of entry, and use of equipment and materials. Notes recommendations on use of general or local anesthesia.

g. Checks to see whether patient or authorized adult has signed consent form. If not, may decide to obtain personally before sedation.

h. Performer may discuss case with referring clinician, specialist, or surgeon to obtain additional information. May arrange for attending physician, anesthesiologist and/or surgeon to accompany performer in

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examination of patient on day prior to the procedure.

2. Performer visits patient and any authorized adult at bedside or in appropriate location. May be accompanied by clinician, anesthesiologist, surgeon, or appropriate specialist.

a. Performer greets patient and/or authorized adult and explains that a brief examination will occur. If any colleagues are with performer, performer introduces them.

b. Performer reads patient's chart. Notes any new clinical developments, response to care or medication. May ask patient or accompanying adult about symptoms and allergies. Examines the patient for relevant symptoms and general state. Reassures and answers questions. If not already done, performer determines whether there is any possibility of pregnancy in the case of a female patient, whether patient has been taken off any oral contraceptive.

c. Performer considers whether there have been changes in the patient's condition since the decision was made to do the procedure, and considers whether there are contraindications to going ahead with the procedure. May confer with specialist, clinician, or surgeon; discusses patient's current condition. Decides whether to proceed, cancel or delay procedure based on assessment of patient's current condition and any discussion.

d. Performer considers site for initial injection (placement of tip of catheter). Considers aortic arch, innominate artery, subcla-

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vian artery or thyrocervical trunk depending on need for bilateral study, degree of detail required, and extent to which the vascular structure is known.

e. If performer decides to proceed, examines femoral and/or axillary arterial pulses to determine best vascular approach and entry site:

   i) Notes strength and expansive nature of the pulsations, presence of bruits (murmurs), presence of grafts, presence and location of ischemic symptoms, local infection. Reviews recommendations.
   ii) Performer considers the condition of the pulses, location of the pathology, areas of interest, clinical and surgical history, age of patient, and purpose of the study. Considers whether bilateral lesions are involved, whether all four arteries supplying thyroid gland will be selectively injected.
   iii) Selects side and puncture site considering condition of area, patient's age and appropriateness for the procedure with minimum trauma to vessels. Avoids puncture site where there is severe atherosclerotic involvement, scars or grafts. Favors a femoral artery over an axillary artery for multiple selective procedure and an axillary artery if femoral pulses are known to be weak or arteries tortuous.
   iv) Performer examines and records presence and character of pulses at, and distal to, the artery to be punctured.

f. If performer decides not to have procedure done, may discuss with

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clinician. Records reasons for cancellation and any recommendations for alternative procedure on patient's chart. Informs staff of cancellation and discusses with patient.

g. Performer may decide to delay procedure, have patient undergo treatment to improve clinical condition, such as treatment for blood pressure, anemia, infectious condition, or malnutrition. Discusses as appropriate and has orders given for care of patient. If patient has been on anticoagulant therapy, may order cessation until prothrombin and/or clotting times are within normal levels. May order cessation of oral contraceptive if not already done. With emergency patient may determine whether delay is contraindicated.

h. If performer decides to proceed and a consent for the procedure has not been obtained, performer may explain to the patient or guardian in comprehensible language what will occur in the procedure, its purpose, and the dangers to the patient involved. Performer explains the alternatives; answers questions.

   i) When the performer is sure that the patient understands the risks, asks the patient for signature on consent form and checks that it is properly signed.
   ii) If a guardian is to sign, performer explains to the individual as appropriate.
   iii) If a consent is not agreed to, performer postpones procedure until it is obtained. May discuss with appropriate physician or individuals and/or

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with patient. Does not proceed unless consent is obtained.

i. Performer decides on the type of equipment to use based on institutional facilities and nature of study:

  i) May order serial single or biplane cassette changer, stereo filming, use of subtraction technique depending on purpose of study and nature of pathology.
  ii) Decides on manual and/or automatic pressure injection.
  iii) Selects types, sizes and lengths of catheter(s), whether j-shaped, preshaped, closed-end, with side holes. May specify type of safety guide wires, floppy wire, size and type of needle, type of contrast solution.

j. Performer may make decisions on care of patient:

  i) Decides on use of general and/or local anesthetic. May discuss with anesthesiologist. If a general anesthetic is to be administered, performer arranges to have staff ready at the appropriate time.
  ii) Performer makes final decisions on prior preparation of the patient such as sedation, period for withholding of food, hydration, use of prior IV drip, shaving of entry site, prior administration of antihistamine, medications to deal with problems of blood clotting. May order EKG (ECG) monitoring.

k. Performer records orders as appropriate so that patient and equipment can be prepared and staff assigned. May sign requisition; places for scheduling.

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  l. Reviews with patient the procedures that will occur.

3. Just prior to the time for which the procedure is scheduled, the performer reviews all the relevant medical information and the patient's chart. Reviews relevant prior radiographs. Notes any new developments.

  a. Performer greets patient in examination room. May question about symptoms; reassures and explains what will occur.
  b. Performer checks that all prior preparatory procedures have been carried out.

    i) Checks report on electrolyte levels, blood clotting time, vital signs.
    ii) Checks that any orders for hydration, starting of IV infusion, prior administration of medication and/or sedation have been carried out, and at appropriate time. If not, arranges to have these done and/or procedure delayed.

  c. Performer examines puncture site to review earlier decision. Makes sure no swelling or tenderness is present. Considers alternative puncture site if appropriate. Indicates puncture site to staff.
  d. Performer orders scout film(s) of the neck and mediastinum in the positions to be used for serial filming. Checks that proper shielding is being used.

    i) Performer places the processed scout films on view boxes and examines as soon as they are ready. Performer considers whether the areas of interest

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are visible, whether the technique is satisfactory, and whether the position(s) of the patient are correct.

ii) If the scouts are not satisfactory, performer indicates the needed changes in technique or in the patient's position to the radiologic technologist.

e. Performer considers whether patient's current condition presents any contraindications to going ahead with the procedure. May have clinician or specialist called; discusses patient's condition and any alternative steps. Decides whether to proceed or not based on need, evaluation of patient's condition and contraindications.

f. If performer decides not to proceed records reasons and any recommendations on patient's chart. Informs appropriate co-worker of cancellation and has patient returned to room. If appropriate, orders rescheduling of patient or scheduling for alternative procedure.

g. If patient is pediatric patient or if general anesthesia has been suggested for adult, performer may reconsider whether general anesthesia is still warranted; may decide to order if patient's behavior and condition suggest the need. If general anesthesia is to be carried out, performer discusses with anesthesiologist when it is to be administered and plans to coordinate with anesthesiologist.

h. May order sedation and/or IV drip if appropriate and not already administered. Has puncture site and possible alternative site shaved and prepared.

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i. Performer may explain or demonstrate use of equipment to a child to allay fears and enlist cooperation; answers questions. Explains that patient will be asked to hold still from time to time. Indicates what will happen, what pain might be experienced, and what cooperation will be needed. Stresses need to maintain positions when ordered.

4. Performer makes final decisions on technique and surgical procedures:

a. Decides on type and sizes of needles, catheters, guide wire.

b. Orders type of iodine-based contrast solution, manual and/or automatic injection, stereographic changer.

c. If stereography will be carried out, indicates the angle (8°) to be used between the x-ray tubes. Has technical factors set for seriography and fluoroscopy.

d. Performer orders program(s) for seriography. Indicates to technologist the number of films to be taken, the per-second intervals, and the number of series anticipated. Allows for arterial, capillary and venous phases. If subtraction will be ordered, indicates what views should be filmed prior to injection of contrast. Has equipment checked.

e. If general anesthesia is to be administered, indicates to anesthesiologist when procedure is to start and allows for appropriate timing.

f. Informs appropriate co-workers of decisions so that patient and materials can be prepared.

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5. Performer returns to patient in procedure room when informed that patient and equipment are ready:
    a. Checks whether patient has been properly shielded, immobilized, and prepared for sterile puncture procedure. If not acceptable, indicates the needed adjustments. May decide to immobilize personally.
    b. Checks sterile tray prepared for procedure. Requests any missing objects.
        i) Performer checks that appropriate needle and catheter sizes and lengths are available and catheters preformed if appropriate. Checks safety guide wires. May preform catheter(s) personally.
        ii) Checks that syringes with saline and/or anticoagulant solution are prepared, that syringes with contrast medium are ready.
        iii) Checks appearance of contrast medium to be sure there is no chemical deterioration; checks amount.
        iv) May prepare syringe with local anesthetic or checks.
    c. If patient has special equipment such as IV or indwelling catheter, performer makes sure that these are being monitored. May check that ECG monitoring equipment is present. Checks that emergency cart is present.
    d. Checks that seriography equipment is ready for use, that technical factors are set for seriography and fluoroscopy, and that equipment for pressure injection (if ordered) is checked and ready for use.
    e. Dons protective lead garments and sterile gown and gloves when appropriate. Checks staff shielding.

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    f. If patient is coherent, performer explains what will be done. Answers patient's questions as appropriate. Reassures patient and does so as deemed needed throughout procedure.
    g. If general anesthesia is to be administered, checks with anesthesiologist to be sure that the patient is ready for procedure to begin.

6. Performer prepares the site for puncture using sterile technique.
    a. Has patient positioned appropriately for the injection site chosen so as to provide access.
        i) For puncture of femoral artery, positions patient in supine position for access below the inguinal ligament as high as possible, but allowing for later compression of the vessel proximal to the puncture site.
        ii) For axillary puncture has patient lie supine with arm abducted and elbow bent, providing access to selected area in the axilla (as peripheral as possible).
        iii) Performer locates the vessel for puncture visually and/or by feeling for arterial pulsation in the location selected. May choose more palpable position in vessel allowing for later compression.
    b. Prepares the site for injection of the local anesthetic and puncture by swabbing with prepared antiseptic solution. Covers surrounding areas with sterile drapes, leaving only small area of injection and puncture uncovered.

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c. Checks amount of local anesthetic to be injected as shown by nurse in syringe, or draws anesthetic into sterile syringe. Checks that no air is present. Inserts needle intradermally and subcutaneously; injects. Makes sure to infiltrate the skin and the sheath of the artery on both sides of the vessel. Removes needle. Waits for area to become anesthetized.

7. Performer proceeds with selective "Seldinger" catheterization as follows:

   a. If patient is conscious, explains when patient is to hold steady for puncture.
   b. Performer feels for the appropriate arterial pulse by palpating with fingers. Makes an incision or nick through the skin with a sterile scalpel at the site where the needle and catheter will enter.
   c. Performer inserts puncture needle tip (appropriately sized hollow needle with sharp cutting inner stylus or teflon needle tip equipped with stylet and teflon sheath) into the incision while palpating and fixing the artery. Performer angles needle to enter along the lateral side of the vessel with the tip directed along the route to be catheterized. May attempt to enter only the anterior arterial wall.
   d. Performer pulls out the needle's inner stylus and withdraws the needle slowly until a characteristic "pop" is felt and a vigorous jet of arterial blood is obtained. May pull back on needle, reinsert, or make other incisions until artery is successfully entered.

      i) With teflon needle performer removes stiff inner needle leaving teflon sheath in place.

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      ii) May advance needle or sheath several inches into lumen of vessel in the direction of the route to be catheterized.

   e. Performer inserts a curved tip safety guide wire into the needle or sheath and advances this into the vessel in the direction of the planned route for catheterization. May advance guide wire before removing needle or sheath and introducing catheter.
   f. Once the guide wire is inserted, performer withdraws the hollow needle or sheath, compressing the artery to reduce the bleeding. Cleans blood off guide wire. Inserts the appropriate size catheter by threading catheter over the guide wire and into the artery.
   g. Performer decides whether to advance the catheter using the guide wire as a leader or to remove guide wire. If so decided, removes guide wire.
   h. Performer may check position of catheter at this point:

      i) Performer uses syringe prepared with a small amount of the contrast solution. Checks that medium is appropriate. Connects syringe to the catheter.
      ii) Positions the overhead fluoroscope unit over the patient; may have lights in room dimmed; activates the fluoroscope; adjusts technical factors or has this done.
      iii) Performer has patient hold still. Injects a small amount of the solution into the artery for viewing location of catheter tip and guide wire.
      v) Locates site of entry of catheter and checks position of cath-

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eter within vessel by viewing on TV monitor. Performer judges whether catheter is correctly inserted in lumen of vessel rather than in an intramural or extravascular position by viewing on TV monitor and watching flow of test dose.

- v) Adjusts position of guide wire and/or catheter to be sure that the catheter is free to pass along the lumen of the vessel.
- vi) If performer judges that entry through femoral site chosen cannot be properly accomplished, performer may decide to enter from the opposite artery or alternative axillary route if appropriate. If so, performer repeats appropriate steps for new location after caring for initial site.
- vii) If entry or placement cannot be easily accomplished, performer may decide to terminate so as to avoid further trauma to vessels. If so, performer records as appropriate and informs staff. May arrange for rescheduling.

i. Performer attaches syringe prepared with saline and/or an anticoagulant to catheter. Flushes catheter periodically to avoid clotting and to keep catheter clear.

8. Performer advances the catheter (with or without guide wire as a leader) under fluoroscopic control, as appropriate, to the first injection site selected.

   a. With femoral route advances the guide wire and/or catheter to the aortic bifurcation and then up the aorta to the aortic arch,and/or right innominate artery,and/or right or left subclavian artery,and /or thyrocervical trunk.

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   b. With axillary route performer advances the catheter to the subclavian artery, and/or aortic arch, and/or thyrocervical trunk.
   c. In advancing the catheter and/or guide wire, performer is careful not to force passage.
   d. If an obstacle is encountered, performer checks position using fluoroscopy, syringe, and small amount of contrast solution (as described above). Injects a small amount of contrast into the artery through the catheter; activates fluoroscope, and views on the TV monitor. Determines problem and redirects guide wire or catheter as appropriate. Performer evaluates entry route if appropriate and may choose alternative route, or decides to terminate as described. Performer repeats appropriate steps for any new location after properly caring for initial site.
   e. Checks location of catheter using test dose and fluoroscopic con trol. Performer removes guide wire if not already done. Reflushes catheter.

9. Performer prepares for immediate injection of contrast and filming:

   a. Has patient positioned for supine AP, lateral or oblique projections.

      - i) Makes sure proper (close) collimation will be observed and appropriate shielding is in place.
      - ii) Checks that patient is properly immobilized, shielded and positioned.
      - iii) For axillary route may apply a tourniquet around the arm, distal to the puncture site, and

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inflate to appropriate pressure. Has pressure checked.

b. Checks with anesthesiologist (if present) and/or ECG monitor to determine patient's condition.
c. Selects quantity of contrast depending on the site of injection and size of the vessels to be opacified as seen with test dose.
d. If pressure injection is to be done by hand, performer prepares or checks syringe with the iodine-based, aqueous contrast solution. Attaches syringe to catheter.
e. If pressure injection is to be done by automatic injector, performer prepares to coordinate injections with filming:

   i) Checks that the automatic injector (used for introduction of the contrast solution under pressure) is loaded with selected amount of medium in syringe; checks that syringe is attached to injector tubing. Attaches tubing to catheter. Checks that there is no air in system.
   ii) Performer checks on or orders the rate and pressure setting for the entry force of the automatic injector. Considers the force of entry needed to inject the contrast medium into the vessel given the technique, vessel, and other conditions involved.

f. Performer has overhead x-ray tube(s) positioned for serial filming; checks with the technologist the rate of speed and length of time selected to allow for plain films for subtraction masks, arterial, capillary, and venous phases as appropriate. For stereo filming using two x-ray tubes, checks appropriate angulation between tubes.
g. When ready, has patient hold steady, if conscious, or awaits indication from anesthesiologist that respiration has been susended.

   i) Has automatic serial cassette changer activated by technologist.
   ii) After allowing for subtraction plain films, activates automatic injector or injects by hand using pressure as decided.

h. Has tourniquet (if applied), removed.
i. Has serial films processed at once.
j. While serial films are being processed, performer examines and talks to patient (if conscious) to evaluate how the patient has responded to the procedures and the injection.

   i) If EKG is being monitored, evaluates any changes during initial injection as possible contraindication for any additional injections.
   ii) May decide to provide emergency care at any time throughout procedure if patient shows signs of adverse reactions.
   iii) Detaches injector tubing. Reflushes catheter.
   iv) May withdraw catheter from an arterial site and allow it to lie relaxed in the aorta.

10. Performer looks at the first set of serial angiograms on view boxes in sequence as soon as they are processed. Looks at stereo films through viewer.

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a. Checks for technical quality and notes whether any irregularities are due to artifacts or actual pathological or abnormal conditions, and whether the views are clear enough for medical interpretation. Performer may ask opinion of another radiologist.

b. If subtraction has been ordered, performer selects the radiographs for subtraction technique. Performer reviews subtraction films when ready. May order second-order subtractions if image is not deemed sharp enough. Repeats additional review as required.

c. Determines whether the angiograms adequately demonstrate the vessels, glands, and structures being studied, and provide sufficient information about any pathology, blockage, or distortion of the flow, the extent and location of any anomalies, malformation, the presence of other signs of abnormal structure or pathology.

   i) Performer may evaluate the size of the gland(s), note whether there is visualization of suspected lesions, note whether superficial structures interfere with visualization of areas of interest.

   ii) Performer considers whether, depending on site of first injection, the catheter tip should be placed in the thyrocervical trunk, the common carotid artery, and/or sequentially and selectively into the inferior thyroid, ascending cervical, and/or superior thyroid (suprascapular and/or superficial cervical) arteries. Considers whether to repeat original injection with a change in patient position and/or technical factors.

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   iii) Performer may study the angiograms as a "road map" for use in selectively placing the catheter for the selective studies and determing the positions and amount of contrast to use.

   iv) In deciding whether to repeat examination or proceed with selective catheterization, performer considers the patient's condition, the contraindications, the information already supplied, and the urgency. May discuss with anesthesiologist and/or clinician.

11. If performer is to undertake selective catheterization, may give orders for use of equipment before moving catheter into selected vessel:

a. Orders amount of contrast based on the size of the artery to be injected as viewed on monitor or angiograms. Orders hand or automatic pressure injection, stereo filming, patient positioning, subtraction technique as decided. May select an appropriate size (smaller) catheter. May preshape catheter to conform with patient's anatomy.

b. If selective arteriography is to be done with a smaller catheter, performer reinserts guide wire until it reaches the proximal catheter tip. Uses fluoroscopic control. Performer then removes catheter while compressing the site. Threads smaller preformed catheter over the guide wire as described. Advances catheter (with guide wire as leader if so decided) into appropriate location as described. Checks placement using test dose and fluoroscopy.

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c. For additional injections, change of position, change in technical factors, performer reviews decisions on injection pressure, amount of contrast, rate and speed of serial programs; indicates what is needed to staff and repeats as appropriate.

d. Performer sequentially withdraws and reinserts the catheter as appropriate to reach the arteries of interest.

  i) For each branch being opacified, performer sequentially places catheter, checks location, injects contrast, takes serial films, flushes to prevent clot formation. Avoids occluding vessel.

  ii) Between individual injections performer may withdraw the catheter from the artery and allow it to lie in the aorta.

  iii) Performer reflushes the catheter periodically with saline and/or anticoagulant. Maintains check on condition of patient. Allows appropriate period of time between injections for reactions to contrast to dissipate.

  iv) If ECG is being monitored, evaluates any changes during injection as possible contraindication for any additional injections.

  v) May decide to provide emergency care at any time throughout procedure if patient shows signs of adverse reactions.

  vi) If performer notes any signs of arterial spasm, may inject an anticoagulant, and/or apply hot packs at once to avoid thrombotic occlusion.

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e. Repeats review of angiograms as described above until satisfied that the views are technically adequate to demonstrate the areas and conditions under study and to provide sufficient information to make possible a competent medical interpretation.

f. After each injection and filming determines whether additional catheterization or positioning is required. Continues until satisfied with diagnostic information.

12. Performer decides when the radiographic examination is completed based on information in the angiograms and the patient's condition. Informs anesthesiologist (if present), technologist, and other staff that procedure is to be terminated.

a. Performer returns to the patient. If patient is conscious, performer reassures patient and explains what will happen next.

b. Removes any connecting tube or syringe from catheter.

c. Performer gently and slowly withdraws the catheter. Manipulates catheter by turning and pulling carefully, taking care not to injure the vessel or enlarge the wound at the entry point.

d. Performer compresses the vessel proximal to or at the puncture site with the fingertips and/or sterile gauze for an appropriate amount of time.

  i) Does not totally occlude the artery. Checks that there is a pulsation distal to the puncture site and no hematoma at the site.

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ii) May have a staff member continue the compression for the time needed. Makes changeover so as to maintain pressure by withdrawing own hands from under those of the relieving staff member once they are in place. e. Performer applies or orders pressure dressing to be kept in place appropriate amount of time. f. Performer may order fluids to be given intravenously or by mouth. May order bed rest for appropriate period while patient recovers from effects of procedure. g. Arranges to have puncture site, extremities and arterial pulses examined regularly over the next few hours and any problems reported at once. Informs patient or attending staff to report further oozing of blood or swelling. h. Performer may order careful observation of patient including vital signs, urinary output, and skin care. May order tests, fill out order forms. May order medication. i. May order delayed urogram appropriate amount of minutes after last injection. j. Has appropriate sanitary clean up procedures carried out. k. If requested, calls surgeon or clinician and reports preliminary results and findings. 13. Performer records impressions of procedure on patient's chart: a. Preliminary findings. b. How patient tolerated procedure. c. Any special nursing follow-up recommended, tests, delayed films ordered, records and observation required, medication, later studies ordered. d. May sign chart, requisition sheet or order forms.	

TASK DESCRIPTION SHEET

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1. What is the output of this task? (Be sure this is broad enough to be repeatable.)

Pt. examined, reassured; decisions made on going ahead, route, technique, site of puncture, contrast medium, maneuvers, serial filming; preparatory orders given; site anesthetized; artery punctured; guide wire and catheter advanced under fluoroscopic control; injection, pt. maneuver and filming coordinated; arteriograms reviewed, approved; emergency care ordered; instruments removed; site compressed; orders for after care, tests, urogram, medical impressions recorded.

2. What is used in performing this task? (Note if only certain items must be used. If there is choice, include everything or the kinds of things chosen among.)

X-ray requisition form; pt.'s medical chart, prior films, scans; pen; view boxes; sterile tray with antiseptic, saline, anticoagulant, swabs, tape, scissors, gauze, pressure dressings, local anesthetic, syringes, puncture needle, scalpels, guide wires, catheters, iodine-based contrast; weights; x-ray table; serial cassette changer; fluoroscope, TV monitor; emergency cart; sterile gown, gloves, drape; shielding

3. Is there a recipient, respondent or co-worker involved in the task? Yes...(x) No...( )

4. If "Yes" to q. 3: Name the kind of recipient, respondent or co-worker involved, with descriptions to indicate the relevant condition; include the kind with whom the performer is not allowed to deal if relevant to knowledge requirements or legal restrictions.

Any pt.; attending MD; radiologist; surgeon; radiologic technologist; nurse

5. Name the task so that the answers to questions 1-4 are reflected. Underline essential words.

Conducting selective subclavian arteriography of any non-pediatric pt. to evaluate thoracic outlet syndrome by examining, reassuring pt.; obtaining consent; deciding whether to go ahead, types of maneuvers, positions; injecting local anesthetic; making puncture; advancing catheter and guide wire under fluoroscopic control; coordinating pt. maneuver, injection of contrast and serial filming; evaluating arteriogram series; ordering emergency care; removing instruments; ordering after care, tests, delayed films; recording orders, medical impressions.

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Performer receives the x-ray requisition form and medical chart of a patient scheduled for arteriographic study of thoracic outlet syndromes (radiographic contrast study of neurovascular syndromes with compression of the subclavian artery and brachial plexus at the superior aperture of the thorax by means of selective arterial catheterization) prior to the procedure, such as on the previous day or evening.

1. Performer reads the patient's medical history and requisition form to review the case or to become familiar with materials seen earlier in consultation, in order to make decisions about the conduct of the radiographic study and to check on the request of the referring physician:
   a. Performer notes the patient's age, sex, weight, height, the name of the referring clinician or surgeon. Notes the nature and location of the suspected pathology or syndrome such as cervical rib, scalenus anticus, costoclavicular, hyperabduction, or pectoralis minor syndrome. Notes whether a bilateral study is involved or side of interest.
   b. Performer notes the purpose of the requested study such as demonstra-

OK-RP; RR; RR

6. Check here if this is a master sheet..(x)

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tion of locations and extent of vascular compression, preoperative demonstration of obstructive lesions, identification and evaluation of multiple lesions.

c. Performer reviews the diagnostic information already obtained, including clinical examinations, any prior radiographic studies, radioisotope scans, results of clinical tests, lab and sensitivity tests, EKG, vital signs, clotting time tests. Notes description of presenting symptoms.
d. Performer notes relevant prior history such as prior incidents of vascular constriction, neurologic disease, removal of any section of the vascular system, grafts and their sites,history of atherosclerosis, heart disease, hypertension, renal, pulmonary, or liver disease, thrombosis, abnormal bleeding tendency, anticoagulation therapy, history of allergies or indications of allergy to iodine-based contrast media. Notes stage of female patient's menstrual cycle, any possibility of pregnancy, whether on oral contraceptive. Notes whether patient has an infectious or communicable condition, especially local infection at possible puncture site.
e. Notes whether prior orders have been given to improve patient's clinical condition; if so, notes progress.
f. Performer notes recommendations on catheterization such as site and route of entry, and use of equipment and materials.
g. Checks to see whether patient or authorized adult has signed consent for procedure. If not, may decide to obtain personally before sedation.
h. Performer may discuss case with referring clinician, specialist, or surgeon to obtain additional information. May arrange for attending physician and/or surgeon to accompany performer in examination of patient on day prior to the procedure.

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2. Performer visits patient at bedside or in appropriate location. May be accompanied by clinician, surgeon, or appropriate specialist.

    a. Performer greets patient and explains that a brief examination will occur. If any colleagues are with performer, performer introduces them.
    b. Performer reads patient's chart. Notes any new clinical developments, response to care or medication. Asks patient to describe symptoms, show the positions in which most pain is felt (such as an occupational movement),indicate the time of day when pain is most severe. Records position. May ask about allergies. With female patient determines whether there is any possibility of pregnancy,whether patient is on oral contraceptive.
    c. Performer carries out physical examination of patient by having patient carry out specific exercises or take positions involving the upper extremity. Notes which maneuvers such as abducting arm,turning and extending head,taking a deep breath, lifting a weight, result in damping or obliteration of radial pulse. Notes whether greatest obliteration of pulse takes place while patient is in erect or supine position. Notes whether one or both sides are involved. Reassures and answers questions.
    d. Performer considers whether there have been changes in the patient's condition since the decision was made to do the procedure, and considers whether there are contra-

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indications to going ahead with the procedure. May confer with specialist, clinician, or surgeon; discusses patient's current condition. Decides whether to proceed, cancel or delay procedure based on assessment of patient's current condition and any discussion.

e. If performer decides to proceed, examines femoral and/or axillary arterial pulses to determine best vascular approach.

  i) Notes strength and expansive nature of the pulsations, presence of bruits (murmurs), presence of grafts, presence and location of ischemic symptoms, local infection. Reviews recommendations.
  ii) Performer considers the condition of the pulses, location of the pathology, areas of interest, clinical and surgical history, age of patient, whether bilateral study is required, condition of puncture site, whether there is severe atherosclerotic involvement, scars or grafts.
  iii) Performer selects right femoral artery over left unless right femoral pulse is weak. Selects femoral approach over axillary, especially for bilateral study. If patient has severe aortofemoral arteriosclerosis performer considers the axillary artery of the uninvolved side.
  iv) Performer examines and records presence and character of pulses at, and distal to, the artery to be punctured.

f. Performer decides whether to examine patient in erect seated or supine positions based on whether there was greater differential dampening or obliteration of upper extremity pulse in erect position.

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g. Performer selects the number of maneuvers to use for serial filming based on the purpose of study, the syndrome involved, and the types of information to be demonstrated. May order neutral position, Adson maneuver, modified Allen, modified Adson, weight lifting, and the position in which patient displays maximal symptoms (movement reported by patient).

h. If performer decides not to have procedure done, may discuss with clinician. Records reasons for cancellation and any recommendations for alternative procedure on patient's chart. Informs staff of cancellation and discusses with patient.

i. Performer may decide to delay procedure, have patient undergo treatment to improve clinical condition, such as treatment for blood pressure, anemia, infectious condition, or malnutrition. Discusses as appropriate and has orders given for care of patient. If patient has been on anticoagulant therapy, may order cessation until prothrombin and/or clotting times are within normal levels. May order cessation of oral contraceptive if not already done.

j. If performer decides to proceed and a consent for the procedure has not been obtained, performer may explain to the patient in comprehensible language what will occur in the procedure, its purpose, and the dangers to the patient involved. Performer explains the alternatives; answers questions.

  i) When the performer is sure that the patient understands the

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risks, asks the patient for signature on consent form and checks that it is properly signed.

ii) If a consent is not agreed to, performer postpones procedure until it is obtained. May discuss with appropriate physician or individuals and/or with patient. Does not proceed unless consent is obtained.

k. Performer decides on the type of equipment to use based on institutional facilities and nature of study:

   i) Orders serial cassette changer for supine or upright filming, hand injection equipment, type of contrast medium (appropriate for cerebral angiography).
   ii) Selects type, size and length of catheter, whether j-shaped, preshaped, closed-end, with side holes. May specify type of safety guide wire, floppy wire, size and type of needle. Orders local anesthetic.

l. Performer decides on prior preparation of the patient such as sedation, period for withholding of food, hydration, use of prior IV drip, shaving of entry site, prior administration of antihistamine, medications to deal with problems of blood clotting. May order EKG (ECG) monitoring.

m. Performer records orders as appropriate so that patient and equipment can be prepared and staff assigned. May sign requisition;places for scheduling.

n. Reviews with patient the procedures that will occur.

3. Just prior to the time for which the procedure is scheduled, the performer

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reviews all the relevant medical information and the patient's chart. Reviews relevant prior radiographs or scans. Notes any new developments.

a. Performer greets patient in examination room. May question again about current symptoms; reassures and explains what will occur.

b. Performer checks that all prior preparatory procedures have been carried out.

   i) Checks report on electrolyte levels, blood clotting time, vital signs.
   ii) Checks that any orders for hydration, starting of IV infusion, prior administration of medication and/or sedation have been carried out, and at appropriate time. If not, arranges to have these done and/or procedure delayed.

c. Performer examines puncture site to review earlier decision. Makes sure no swelling or tenderness is present. Considers alternative puncture site if appropriate. Indicates puncture site to staff.

d. Performer considers whether patient's current condition presents any contraindications to going ahead with the procedure or suggestion that examination is not warranted. May have clinician or specialist called; discusses patient's condition and any alternative steps. Decides whether to proceed or not based on need, evaluation of patient's current condition and any contraindications.

e. If performer decides not to proceed, records reasons and any recommendations on patient's chart. Informs appropriate co-worker of cancellation and has patient re-

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turned to room. If appropriate, orders rescheduling of patient or scheduling for alternative procedure.

f. Performer may order a scout film of patient's shoulder and chest on side of interest, or bilateral relaxed AP position (supine or erect depending on position for arteriography). Checks that proper shielding will be used.

  i) Performer places the processed scout film on a view box and examines as soon as ready. Performer considers whether the area of interest is visible, whether the technique is satisfactory, and whether the position of the patient is correct.
  ii) If the scout is not satisfactory, performer indicates the needed changes in technique or in the patient's position to the radiologic technologist.

g. May order sedation and/or IV drip if appropriate and not already administered. Has puncture site and possible alternative site shaved and prepared.

h. Performer may explain or demonstrate use of equipment to patient to allay fears and enlist cooperation; answers questions. Explains that patient will be asked to hold still from time to time. Indicates what will happen, what pain might be experienced, and what cooperation will be needed. Stresses need to maintain positions when ordered.

i. Performer may rehearse patient in each maneuver in the sequence in which they will be undertaken. If so, may demonstrate and/or rehearse any or all of the following:

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  i) For neutral position has patient lie in supine position or sit erect with arm on side (s) of interest in a comfortable relaxed position at patient's side(s).
  ii) For the Adson maneuver has patient sit upright and place arm(s) of interest in lap or on knee. Has patient extend the neck, turn the chin toward the side of interest (or each side separately). Has patient practice breathing in deeply and holding breath in this position until told to relax.
  iii) For a modified Allen maneuver, has patient lie supine or sit erect. Has patient abduct the upper arm on the side of interest as close to 90° as possible, with the lower arm rotated outward. Has patient turn head away from the side of interest. Has patient practice breathing in deeply and holding as described above.
  iv) For a variation of the modified Allen maneuver (modified Adson) has patient take position as for modified Allen maneuver, but with head turned toward the side of interest.
  v) For weight lifting maneuver has patient take supine position with humerus abducted about 60°, rotated slightly outward, elbow flexed and palm up, resting on table. Performer selects a weight of 5 to 12 pounds. Places weight on palm. Has patient plan to attempt lifting weight a few inches off the table when requested (during injection).
  vi) For position reported by patient in which maximal symptoms

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are experienced, performer instructs patient to repeat the position when ordered, and hold until told to relax.

j. Performer makes final decisions on technique,materials, contrast, type and size of catheter, needle, guide wires, type and amount of contrast.

  i) Has technical factors set for seriography and fluoroscopy.
  ii) Performer orders program(s) for seriography. Indicates to technologist the number of films to be taken, the per-second intervals, and the number of series anticipated.

k. Informs appropriate co-workers of decisions so that patient and materials can be prepared.

4. Performer returns to patient in procedure room when informed that patient and equipment are ready:

  a. Checks whether patient has been properly shielded, immobilized, and prepared for sterile puncture procedure. If not acceptable, indicates the needed adjustments. May decide to immobilize personally.
  b. Checks sterile tray prepared for procedure. Requests any missing objects.

    i) Performer checks that appropriate needle and catheter sizes and lengths are available and catheters preformed if appropriate. Checks safety guide wires. May preform catheter personally.
    ii) Checks that syringes with saline and/or anticoagulant solution are prepared, that syringes with contrast medium are ready.

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    iii) Checks appearance of contrast medium to be sure there is no chemical deterioration; checks amount.
    iv) May prepare syringe with local anesthetic or checks.

  c. If patient has special equipment such as IV or indwelling catheter, performer makes sure that these are being monitored. May check that ECG monitoring equipment is present. Checks that emergency cart is present.
  d. Checks that seriography equipment is ready for use, that technical factors are set for seriography and fluoroscopy.
  e. Dons protective lead garments and sterile gown and gloves when appropriate. Checks staff shielding.
  f. Performer explains to patient what will be done. Answers patient's questions as appropriate. Reassures patient and does so as deemed needed throughout procedure.

5. Performer prepares the site for puncture using sterile technique.

  a. Has patient positioned appropriately for the injection site chosen so as to provide access.

    i) For puncture of femoral artery, positions patient in supine position for access below the inguinal ligament as high as possible, but allowing for later compression of the vessel proximal to the puncture site.
    ii) For axillary puncture has patient lie supine with arm abducted and elbow bent, providing access to selected area in the axilla.
    iii) Performer locates the vessel for puncture visually and/or

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by feeling for arterial pulsation in the location selected. May choose more palpable position in vessel allowing for later compression.

b. Prepares the site for injection of the local anesthetic and puncture by swabbing with prepared antiseptic solution. Covers surrounding areas with sterile drapes, leaving only small area of injection and puncture uncovered.

c. Checks amount of local anesthetic to be injected as shown by nurse in syringe, or draws anesthetic into sterile syringe. Checks that no air is present. Inserts needle intradermally and subcutaneously; injects. Makes sure to infiltrate the skin and the sheath of the artery on both sides of the vessel. Removes needle. Waits for area to become anesthetized.

6. Performer proceeds with selective "Seldinger" catheterization as follows:

   a. Explains when patient is to hold steady for puncture.
   b. Performer feels for the appropriate arterial pulse by palpating with fingers. Makes an incision or nick through the skin with a sterile scalpel at the site where the needle and catheter will enter.
   c. Performer inserts puncture needle tip (appropriately sized hollow needle with sharp cutting inner stylus or teflon needle tip equipped with stylet and teflon sheath) into the incision while palpating and fixing the artery. Performer angles needle to enter along the lateral side of the vessel with the tip directed along the course of

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the artery. May attempt to enter only the anterior arterial wall.

   d. Performer pulls out the needle's inner stylus and withdraws the needle slowly until a characteristic "pop" is felt and a vigorous jet of arterial blood is obtained. May pull back on needle, reinsert, or make other incisions until artery is successfully entered.

      i) With teflon needle performer removes stiff inner needle leaving teflon sheath in place.
      ii) May advance needle or sheath several inches into lumen of vessel in the direction of the route to be catheterized.

   e. Performer inserts a curved tip safety guide wire into the needle or sheath and advances this into the vessel in the direction of the planned route for catheterization. May advance guide wire before removing needle or sheath and introducing catheter.
   f. Once the guide wire is inserted, performer withdraws the hollow needle or sheath, compressing the artery to reduce the bleeding. Cleans blood off guide wire. Inserts the appropriate size catheter by threading catheter over the guide wire and into the artery.
   g. Performer decides whether to advance the catheter using the guide wire as a leader or to remove guide wire. If so decided, removes guide wire.
   h. Performer may check position of catheter at this point:

      i) Performer uses syringe prepared with a small amount of the con-

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trast solution. Checks that medium is appropriate. Connects syringe to the catheter.

ii) Positions the overhead fluoroscope unit over the patient; may have lights in room dimmed; activates the fluoroscope; adjusts technical factors or has this done.

iii) Performer has patient hold still. Injects a small amount of the solution into the artery for viewing location of catheter tip and guide wire.

iv) Locates site of entry of catheter and checks position of catheter within vessel by viewing on TV monitor. Performer judges whether catheter is correctly inserted in lumen of vessel rather than in an intramural or extravascular position by viewing on TV monitor and watching flow of test dose.

v) Adjusts position of guide wire and/or catheter to be sure that the catheter is free to pass along the lumen of the vessel.

vi) If performer judges that entry through femoral site chosen cannot be properly accomplished, performer may decide to enter from the opposite artery or contralateral axillary route if appropriate. If so, performer repeats appropriate steps for new location after caring for initial site.

vii) If entry or placement cannot be easily accomplished, performer may decide to terminate so as to avoid further trauma to vessels. If so, performer records as appropriate and informs staff. May arrange for rescheduling.

i. Performer attaches syringe prepared with saline and/or an anticoagulant to catheter. Flushes catheter periodically to avoid clotting and to keep catheter clear.

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7. Performer advances the catheter (with or without guide wire as a leader) under fluoroscopic control, as appropriate to the selected route:

a. For femoral route performer advances the guide wire and/or catheter to the aortic bifurcation, then into descending aorta and aortic arch.

i) For right subclavian injection advances catheter into right innominate artery and then the proximal end of the right subclavian artery.

ii) For left subclavian injection advances catheter directly into the proximal end of the left subclavian artery.

b. For transaxillary route performer advances the guide wire and/or catheter retrogradely along the axillary artery and into the contralateral subclavian artery.

i) For left subclavian injection advances catheter into the right innominate artery, the arch of the aorta, and then to the proximal end of the left subclavian artery.

ii) For right subclavian injection advances catheter into the arch of the aorta, the right innominate artery and then to the proximal end of the right subclavian artery.

c. In advancing the catheter and/or guide wire, performer is careful not to force passage.

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d. If an obstacle is encountered, performer checks position using fluoroscopy, syringe, and small amount of contrast solution (as described above). Injects a small amount of contrast into the artery through the catheter; activates fluoroscope, and views on the TV monitor. Determines problem and redirects guide wire or catheter as appropriate. Performer evaluates entry route if appropriate. May choose alternative route, or decides to terminate as described. Performer repeats appropriate steps for any new location after properly caring for initial site.

e. Checks location of catheter using test dose and fluoroscopic control. Performer removes guide wire if not already done. Reflushes catheter.

8. Performer prepares for immediate injection of contrast and filming:

a. Performer has patient positioned for supine AP filming or seated erect in front of cassette changer for AP projections.

b. Makes sure proper (close) collimation will be observed and appropriate shielding is in place for patient and staff.

c. Performer prepares or checks syringe with iodine-based aqueous contrast solution. Plans to inject small doses to avoid overfilling of vertebral arteries. Uses smaller amounts for positions known to have dampening effects on radial pulse.

d. Performer has x-ray tube positioned for serial filming; checks with the technologist the rate of speed and length of time selected for first maneuver.

i) May review instructions to patient on maneuver and respiration.

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ii) When ready, has patient hold still while performer injects the contrast using appropriate pressure.

iii) Has automatic serial cassette changer activated by technologist.

iv) Has patient carry out maneuver and suspend breathing on inspiration as rehearsed in coordination with injection and filming.

v) Has serial films processed after each injection or continues with the other maneuvers and injections planned.

e. After each injection performer examines and talks to patient to evaluate how the patient has responded to the procedures and the injection.

i) If EKG is being monitored, evaluates any changes during initial injection as possible contraindication for any additional injections.

ii) May decide to provide emergency care at any time throughout procedure if patient shows signs of adverse reactions.

iii) Reflushes catheter.

9. Performer looks at the serial subclavian arteriograms as they are processed, in sequence.

a. Checks for technical quality and notes whether any irregularities are due to artifacts or actual pathological or abnormal conditions, and whether the views are clear enough for medical interpretation. Performer may ask opinion of another radiologist.

b. Evaluates whether the arteriograms provide consistent and re-

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producible evidence of compression defects, lesions and their sites.

c. Performer may decide to repeat a position or injection with patient erect if original filming was supine; may decide to have technical factors changed or inject additional contrast. Performer may decide to have patient undertake maneuver(s) not yet done with additional injection(s). Performer may decide to repeat any or all of the examination for the other side.

d. In deciding whether to repeat examination or continue, performer considers the patient's condition, the contraindications, the information already supplied, and the urgency.

e. If performer decides to do bilateral study, performer may reinsert guide wire until it reaches the proximal catheter tip. Uses fluoroscopic control.

   i) Performer then withdraws catheter from subclavian artery just studied and into the aortic arch.
   ii) Then, under fluoroscopic control, renegotiates pathway into proximal end of the subclavian artery on the other side as described. Removes guide wire when appropriate.
   iii) Repeats test injection. Reflushes catheter.

f. For additional injections performer makes decisions on amount of contrast, rate and speed of serial programs; indicates what is needed to staff and repeats as appropriate. Allows elapse of time between injections. Evaluates arteriograms.

g. Performer reflushes the catheter periodically with saline and/or anticoagulant. Maintains check on condition of patient including EKG monitoring. Allows appropriate period of time between injections for reactions to contrast to dissipate.

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h. If performer notes any signs of arterial spasm, may inject an anticoagulant, and/or apply hot packs at once to avoid thrombotic occlusion. May decide to provide emergency care at any time throughout procedure if patient shows signs of adverse reactions.

i. Continues until satisfied with diagnostic information.

10. Performer decides when the radiographic examination is completed based on information on the arteriograms and the patient's condition. Informs technologist and other staff that procedure is to be terminated.

a. Performer returns to the patient. Reassures patient and explains what will happen next.

b. Removes any syringe from catheter.

c. Performer gently and slowly withdraws the catheter. Manipulates by turning and pulling carefully, taking care not to injure the vessel or enlarge the wound at the entry point.

d. Performer compresses the vessel proximal to or at the puncture site with the fingertips and/or sterile gauze for an appropriate amount of time.

   i) Does not totally occlude the artery. Checks that there is a pulsation distal to the puncture site and no hematoma at the site.
   ii) May have a staff member continue the compression for the

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time needed. Makes changeover so as to maintain pressure by withdrawing own hands from under those of the relieving staff member once they are in place. e. Performer applies or orders pressure dressing to be kept in place appropriate amount of time. f. Performer may order fluids to be given intravenously or by mouth. May order bed rest for appropriate period while patient recovers from effects of procedure. g. Arranges to have puncture site, extremities, and arterial pulses examined regularly over the next few hours and any problems reported at once. Informs patient or attending staff to report further oozing of blood or swelling. h. Performer may order careful observation of patient including vital signs, urinary output, and skin care. May order tests, fill out order forms. May order medication. i. May order delayed urogram appropriate amount of minutes after last injection. j. Has appropriate sanitary clean up procedures carried out. k. If requested, calls surgeon or clinician and reports preliminary results and findings. 11. Performer records impressions of procedure on patient's chart: a. Preliminary findings. b. How patient tolerated procedure. c. Any special nursing follow-up recommended, tests, delayed films ordered, records and observation required, medication, later studies ordered. d. May sign chart, requisition sheet or order forms.	

TASK DESCRIPTION SHEET

Task Code No. 481

This is page 1 of 12 for this task.

1. **What is the output of this task?** (Be sure this is broad enough to be repeatable.)

Pt. examined,reassured;decisions made on going ahead, method,technique,site of puncture and injection,contrast medium,type of injection,serial filming;preparatory orders given;site anesthetized;vein punctured;needle placed or guide wire and catheter advanced under fluoroscopic control;injection and filming coordinated;angiograms reviewed;procedure continued until final approval;emergency care ordered;instruments removed;site compressed;orders for after care, tests,delayed films,medical impressions recorded.

2. **What is used in performing this task?** (Note if only certain items must be used. If there is choice, include everything or the kinds of things chosen among.)

X-ray requisition form;pt.'s medical chart;prior films,scans;pen;view boxes;sterile tray with antiseptic,saline,anticoagulant,Decholin,swabs,tape,scissors,gauze,pressure dressings,local anesthetic,syringes,puncture needles,scalpels,guide wire,catheter; tourniquet;automatic injector;iodine-based contrast; x-ray table;serial cassette changer(s);fluoroscope, TV monitor;emergency cart;sterile gown,gloves;drape; shielding

3. Is there a recipient, respondent or co-worker involved in the task? Yes...(x) No...( )

4. If "Yes" to q. 3: Name the kind of recipient, respondent or co-worker involved, with descriptions to indicate the relevant condition; include the kind with whom the performer is not allowed to deal if relevant to knowledge requirements or legal restrictions.

Any pt.;authorized adult;attending MD;radiologist;anesthesiologist;surgeon;radiologic technologist;nurse

5. **Name the task** so that the answers to questions 1-4 are reflected. Underline essential words.

Conducting intravenous angiocardiography of any pt. by percutaneous selective catheterization or direct needle puncture,by examining,reassuring pt.,obtaining consent;deciding on method,technique,site,preparation;deciding whether to go ahead;deciding serial program based on circulation time;deciding type of injection,pressure,materials,contrast;injecting local anesthetic;making puncture;advancing needle,or catheter and guide wire under fluoroscopic control;coordinating injection of contrast and filming;evaluating angiograms;ordering,approving additional injections and angiograms as appropriate;ordering emergency care; removing instruments;ordering after care,tests,delayed films;recording orders,medical impressions.

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Performer receives the x-ray requisition form and medical chart of a patient scheduled for intravenous angiocardiography (radiographic contrast study of the heart, great vessels,such as pulmonary arteries and descending aorta,by means of percutaneous needle or catheter injection into a vein or the superior vena cava) prior to the procedure, such as on the previous day or evening.

1. Performer reads the patient's medical history and requisition form to review the case or to become familiar with materials seen earlier in consultation in order to make decisions about the conduct of the radiographic study and to check on the request of the referring physician:

   a. Performer notes the patient's age, sex, weight, height, the name of the referring clinician or surgeon.

   b. Notes the purpose of the requested study, such as for information for use prior to surgery or for diagnosis. Notes whether the areas of interest include the heart, pulmonary arteries,thoracic or abdominal aorta, innominate arteries, and side of interest. Notes the nature and location of the suspected pathology or symptomatology, such as vascular occlusive disease, soft

OK-RP;RR;RR

6. Check here if this is a master sheet..(x)

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tissue tumors, aneurysms, aortic insufficiency, stenosis, arteriovenous fistulas, massive pulmonary embolism or congenital anomalies.

c. Performer notes relevant prior history such as incidents of vascular constriction, removal of any section of the vascular system, grafts and their sites, history of atherosclerosis, heart disease, renal, pulmonary, or liver disease, history of allergies or indications of allergy to iodine-based contrast media, abnormal bleeding tendency, anticoagulation therapy.

d. Performer reviews the diagnostic information already obtained, including any prior radiographic studies, radioisotope scans, ultrasonograms, results of clinical tests, lab tests, ECG, vital signs. If already done, notes results of allergy test, clotting time tests; notes stage of female patient's menstrual cycle, any possibility of pregnancy, whether on oral contraceptive. Notes if patient has infectious or communicable condition, especially at possible puncture site.

e. Notes whether prior orders have been given to improve patient's clinical condition; if so, notes progress.

f. Performer notes recommendations on technique, such as use of direct needle puncture or catheterization, site of injection, and materials. Notes recommendations on use of general or local anesthesia.

g. Checks to see whether patient or authorized adult has signed consent form. If not, may decide to obtain personally before sedation.

h. Performer may discuss case with referring clinician, specialist, or surgeon to obtain additional information. May arrange for attending physician, anesthesiologist and/or surgeon to accompany performer in examination of patient on day prior to the procedure.

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2. Performer visits patient and any authorized adult at bedside or in appropriate location. May be accompanied by clinician, anesthesiologist, surgeon, or cardiologist.

   a. Performer greets patient and/or authorized adult and explains that a brief examination will occur. If any colleagues are with performer, performer introduces them.

   b. Performer reads patient's chart. Notes any new clinical developments, response to care or medication. May ask patient or accompanying adult about symptoms and allergies. Examines the patient for relevant symptoms and general state. Reassures and answers questions. If not already done, performer determines whether there is any possibility of pregnancy in the case of a female patient, whether patient has been taken off any oral contraceptive.

   c. Performer considers whether there have been changes in the patient's condition since the decision was made to do the procedure, and considers whether there are contraindications to going ahead with the procedure. May confer with specialist, clinician, or surgeon; discusses patient's current condition. Decides whether to proceed, cancel, or delay procedure based on assessment of patient's current condition and any discussion.

   d. If performer decides to proceed, examines patient to help determine whether to use direct needle or catheter injection and appropriate site for puncture and/or injection.

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- i) Performer considers catheterization via an antecubital or axillary vein and injection in the innominate vein or superior vena cava, or direct needle injection in antecubital vein or lower extremity vein.
- ii) Performer examines the possible puncture sites. Notes the presence of grafts, location of ischemic symptoms, local infection. Considers the condition of the vessel, its ease of palpation, patient's clinical and surgical history, age of patient, nature of symptoms, and area and side of interest. Considers the specific contraindications for each method and site. Selects preferred method and entry site and side most appropriate for the individual patient, and notes alternative second choice.
- iii) Performer decides on appropriate needle size and type, appropriate catheter (size and length, number of preformed curves, type of end, whether straight, j-shaped, whether closed or open ended, whether with side holes), type of safety guide wires, based on the method and site chosen, and patient's size.
- iv) Performer decides on type and quantity of iodine-based contrast solution based on the patient's size, age, site of injection and area of interest. Decides on manual or automatic injection based on method chosen.
- v) Performer decides on the type of equipment to use based on the nature of the study and institutional facilities. May order serial single or biplane cassette changer, depending on area of interest, purpose of study and nature of pathology.

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e. If performer decides not to have procedure done, may discuss with clinician. Records reasons for cancellation and any recommendations for alternative procedure on patient's chart. Informs staff of cancellation and discusses with patient.

f. Performer may decide to delay procedure, have patient undergo treatment to improve clinical condition, such as treatment for blood pressure, anemia, infectious condition, or malnutrition. Discusses as appropriate and has orders given for care of patient. If patient has been on anticoagulant therapy, may order cessation until prothrombin and/or clotting times are within normal levels. May order cessation of oral contraceptive if not already done. With emergency patient may determine whether delay is contraindicated.

g. If performer decides to proceed and a consent for the procedure has not been obtained, performer may explain to the patient or guardian in comprehensible language what will occur in the procedure, its purpose, and the dangers to the patient involved. Performer explains the alternatives; answers questions.

- i) When the performer is sure that the patient understands the risks, asks the patient for signature on consent form and checks that it is properly signed.
- ii) If a guardian is to sign, performer explains to the individual as appropriate.
- iii) If a consent is not agreed to, performer postpones procedure until it is obtained. May discuss with appropriate physician

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or individuals and/or with patient. Does not proceed unless consent is obtained.

h. Performer decides on care to be provided for patient:

  i) Decides on use of general and/or local anesthetic. May discuss with anesthesiologist. If a general anesthetic is to be administered, performer arranges to have staff ready at the appropriate time.
  ii) Performer makes final decisions on prior preparation of the patient such as sedation, period for withholding of food, hydration, use of prior IV drip, cleansing enema, shaving of entry site, prior administration of antihistamine, medications to deal with problems of blood clotting, fluctuations in blood pressure.
  iii) May request EKG monitoring; may have arm-to-tongue circulation time tested and recorded or decides to do personally.

i. Performer records orders as appropriate so that patient and equipment can be prepared and staff assigned. May sign requisition; places for scheduling unless emergency procedure will be done at once.
j. May review with patient the procedures that will occur.

3. Just prior to the time for which the procedure is scheduled, the performer reviews all the relevant medical information and the patient's chart. Reviews relevant prior radiographs or scans. Notes any new developments.

  a. Performer greets patient in examination room. May question about symptoms; reassures and explains what will occur.
  b. Performer checks that all prior preparatory procedures have been carried out.

    i) Checks report on electrolyte levels, blood clotting time, vital signs. Notes circulation time if already recorded.
    ii) Checks that any orders for hydration, starting of IV infusion, prior administration of medication and/or sedation have been carried out, and at appropriate time. If not, arranges to have these done and/or procedure delayed.

  c. Performer examines puncture site to review earlier decisions. Makes sure no swelling or tenderness is present. Considers alternative puncture site and/or method if appropriate. Indicates final puncture site and method to staff.
  d. Performer may order scout film(s) of chest (and abdomen if relevant) as appropriate for single or biplane views. Makes sure proper shielding is being used.

    i) Performer places the processed scout film(s) on view boxes and examines as soon as processed. Considers whether the areas of interest are visible, whether the technique is satisfactory, and whether the position(s) of the patient are correct.
    ii) If the scout(s) are not satisfactory, performer indicates the needed changes in technique or in the patient's position to the radiologic technologist.

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   - iii) Performer evaluates information on scout(s) for relevance to performing any planned catheterization, such as site for injection.

e. Performer considers whether patient's current condition presents any contraindications to going ahead with the procedure. May have clinician or specialist called; discusses patient's condition and any alternative steps. Decides whether to proceed or not based on need, evaluation of patient's condition, and contraindications.

f. If performer decides not to proceed, records reasons and any recommendations on patient's chart. Informs appropriate staff of cancellation and has patient returned to room. If appropriate, orders rescheduling of patient or scheduling for alternative procedure.

g. If patient is pediatric patient or if general anesthesia has been suggested for adult, performer may reconsider whether general anesthesia is still warranted; may decide to order if patient's behavior and condition suggest the need. If general anesthesia is to be carried out, performer discusses with anesthesiologist when it is to be administered and plans to coordinate with anesthesiologist.

h. May order sedation and/or IV drip if appropriate and not already administered. Has puncture site and possible alternative site shaved and prepared.

i. Performer may explain or demonstrate use of equipment to a child to allay fears and enlist cooperation; answers questions. Explains that patient will be asked to hold still from time to time. Indicates what will happen, the positions patient will be asked to take, what pain might be experienced, and what cooperation will be needed. Stresses need to maintain positions when ordered.

j. If not already done, performer may decide to test the arm-to-tongue circulation time in order to plan program for seriography so as to visualize the desired circulatory phases of the right heart, left heart, pulmonary arteries, aorta, innominate arteries.

   - i) Indicates to patient that he or she must report the moment a bitter taste is detected on the tongue after injection of Decholin.
   - ii) Has staff member prepare intravenous injection site in arm as described below and indicates who will time circulation time;or decides to do personally.
   - iii) Checks prepared syringe of Decholin; may have tourniquet applied to expose prepared antecubital venous site.
   - iv) Inserts needle into vein, checking location by aspirating slightly to note venous return. Then injects Decholin and has timing commence. Reminds patient to report bitter taste.
   - v) Notes circulation time. Calculates proper program for seriography so that filming and planned injection of contrast will demonstrate the areas of interest as they are opacified.

k. Performer orders program for seriography, allowing proper elapse of time to provide the phases re-

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quired. Informs technologist of the number of films to be taken, the per-second intervals, the number of series anticipated. Has equipment checked.

l. If a biplane study is involved, orders desired projections and/or angulation. Indicates whether biplane films will be taken simultaneously or sequentially. Indicates stage of suspended respiration required for filming.
m. Considering the method and puncture site selected, performer reviews prior orders for size and type of puncture needle(s), size and type of guide wire, the type and amount of contrast, use of automatic or manual injection. Orders any changes necessary. Has technical factors set for fluoroscopy.
n. If general anesthesia is to be administered, indicates to anesthesiologist when procedure is to start and allows for appropriate timing.
o. Informs appropriate co-workers of decisions so that patient and materials can be prepared.

4. Performer returns to patient in procedure room when informed that patient and equipment are ready:

   a. Checks whether patient has been properly shielded, immobilized, and prepared for sterile puncture procedure. If not acceptable, indicates the needed adjustments. May decide to immobilize personally.
   b. Checks that ECG monitoring equipment is present if ordered, and that emergency cart is present.
   c. Checks sterile tray prepared for procedure. Requests any missing objects.

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      i) Performer checks that appropriate types and sizes of needles, catheters, and guide wires are present, that catheter is preformed as appropriate, with side holes if ordered. Checks safety guide wire. May bend catheters personally.
      ii) Checks that syringes with saline and/or anticoagulant solution are prepared, that syringes with contrast medium are ready.
      iii) Checks appearance of contrast medium to be sure there is no chemical deterioration; checks amount.
      iv) May prepare syringe with local anesthetic or checks.

   d. Checks that seriography equipment is ready for use, that technical factors are set for seriography and fluoroscopy, and that equipment for pressure injection, if ordered, is checked and ready for use.
   e. Dons protective lead garments and sterile gown and gloves when appropriate. Checks staff shielding.
   f. If patient is coherent, performer explains what will be done. Answers patient's questions as appropriate. Reassures patient and does so as deemed needed throughout procedure.
   g. If general anesthesia is to be administered, checks with anesthesiologist to be sure that the patient is ready for procedure to begin.

5. Unless already done, performer prepares the puncture site for insertion of the puncture needle (and/or catheter) using sterile technique:

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a. Has patient positioned appropriately for the injection site chosen so as to provide access, and locates the point of entry:

  i) For the femoral vein, has patient placed in supine position with access just below the inguinal ligament on the side selected. May rotate thigh externally and abduct slightly. Locates the vessel by finding the proximal pulse of the femoral artery and palpating a point just medial at 5 to 8 cm. below Poupart's ligament.
  ii) For the antecubital vein has patient lie supine with arm supported and cubital area exposed. May apply tourniquet to facilitate visual and tactile location of vein.
  iii) For axillary vein has patient lie supine with arm abducted and rotated so hand is palm upward and forearm parallel with patient's head. Performer locates the area of maximum arterial pulsation and finds a point below and lateral to the artery, usually just distal to the pectoral muscle fold.

b. Prepares the site for injection of the local anesthetic and puncture by swabbing with prepared antiseptic solution. Covers surrounding areas with sterile drapes, leaving only small area of injection and puncture uncovered.

c. Checks amount of local anesthetic to be injected as shown by nurse in syringe, or draws anesthetic into sterile syringe. Checks that no air is present and inserts needle intradermally and subcutaneously; injects. Makes sure to infiltrate the skin and the sheath of the vein on both sides of the vessel. Removes needle. Waits for area to become anesthetized.

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6. When the entry area has become anesthetized, performer makes sure that the entry site is optimally distended and prepares for puncture:

  a. Chooses teflon puncture needle or needle with polyetheline tubing attached based on method selected. Performer may use a scalpel to make a small incision at the entry site (to facilitate entry of needle).
  b. Performer has patient hold still. Performer attempts to penetrate the vein (at the incision if created), while palpating and fixing vein. Performer inserts needle in the direction of flow.
  c. Performer pulls out the needle's inner stylus; attaches vena tube or syringe to needle; suctions back and checks needle entry by noting whether venous blood appears. Removes vena tube or syringe. May pull back on needle and reinsert or make other insertions until the needle tip is judged within the lumen of the vein. Removes tourniquet.
  d. Performer attaches syringe with saline to needle. Injects saline to check whether the needle is obstructed and to note the pressure necessary for adequate injection.
  e. Performer may use radiography or fluoroscopy to check needle placement and evaluate amount of contrast to inject:

    1) Has tubing attached to needle cut near proximal end of needle.

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ii) Positions overhead x-ray tube or fluoroscope unit over patient to visualize needle within the vein. Has patient hold still. Injects a small test dose of the contrast solution into the vein and activates fluoroscope or has technologist take overhead view.

iii) With fluoroscopy, observes the flow of the contrast on the TV monitor. Performer adjusts needle position if required while viewing on TV monitor. Performer judges whether needle is correctly inserted in lumen of vessel rather than in an intramural or extravascular position by viewing on TV monitor and watching flow of test dose. Adjusts position of Seldinger needle to be sure that the catheter will be free to pass along the lumen of the vessel. While noting the flow of the test dose, performer decides on the appropriate amount of contrast to inject and the speed and force to use for the injection.

iv) With radiography, performer views radiograph on view box when it is brought or goes to automatic processor. Evaluates and decides whether needle is at correct depth and "lie" in lumen or needs to be readjusted. Repeats insertion and radiography until this is accomplished.

f. For direct needle injection, performer may insert a guide wire into needle several inches into the vessel and advance the needle over this to lodge it firmly in the lumen of the vessel.

i) Removes guide wire and wipes off blood.

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ii) If teflon needle is used performer removes stiff inner needle after checking correct placement, leaving teflon sheath in place. May advance sheath several inches into lumen of vessel in the direction of flow.

iii) Performer may secure needle or sheath with tape and flush periodically with saline solution.

7. If performer is to carry out "Seldinger" catheterization proceeds as follows:

a. Performer inserts a curved tip safety guide wire into the needle or sheath and advances this into the vessel in the direction of the planned route for catheterization. May advance guide wire before removing needle or sheath and introducing catheter.

b. Once the guide wire is inserted, performer withdraws the needle or sheath, compressing the vein to reduce the bleeding. Cleans blood off guide wire. Inserts the appropriate size catheter by threading catheter over the guide wire and into the vein.

c. Performer advances the catheter (with or without guide wire as a leader) under fluoroscopic control, as appropriate, to the selected injection site:

i) For injection into the innominate vein, performer advances catheter tip from the antecubital to the axillary vein and into the innominate. Positions tip so that it is proximal to the union of the internal jugular and the subclavian veins,

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and advanced sufficiently to avoid backflow into axillary vein or slippage of catheter into jugular vein.

ii) For injection into the superior vena cava, performer advances catheter along the subclavian vein and down into the superior vena cava.

d. Performer attaches syringe prepared with saline and/or an anticoagulant to catheter tubing or sheath. Flushes periodically to avoid clotting.

e. In advancing the catheter and guide wire, performer is careful not to force passage.

f. If an obstacle is encountered, performer checks position using fluoroscopy, syringe, and small amount of contrast solution (as described above). Injects a small amount of contrast into the vein through the catheter; activates fluoroscope and views on the TV monitor. Determines problem and redirects guide wire or catheter as appropriate. Performer evaluates entry route if appropriate and may choose alternative route or direct needle puncture. Performer repeats appropriate steps for any new location after properly caring for initial site.

g. When catheter tip has been positioned, performer injects test dose of contrast under fluoroscopic control as described above. Notes passage of contrast. Checks that position of catheter is parallel with vascular wall so that injection will not damage wall, and that a free passage of injection is assured. Readjusts as appropriate.

8. Performer prepares for immediate injection of contrast and filming:

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a. If the site of injection is in the arm or innominate vein, performer may have patient take seated position. Has patient's arm extended without flexing and raised to permit a straight path to the right atrium.

b. For lower extremity injection has patient placed in supine, horizontal or Trendelenburg position.

c. Has x-ray tube(s) positioned for frontal and/or lateral projection(s).

d. Reviews with technologist at what stage of injection the filming is to begin, depending on the phases to be visualized.

e. If patient is not under anesthesia, may rehearse patient in suspending and holding breath on inspiration. If a Valsalva maneuver is to be used, performer demonstrates and rehearses patient in taking a deep breath, holding breath in, and bearing down as though evacuating until told to relax.

f. Makes sure proper (close) collimation will be observed and that appropriate shielding is in place.

g. If pressure injection is to be done by hand, performer prepares or checks syringe with the iodine based, aqueous contrast solution for correct quantity. Attaches to needle, sheath or catheter. Checks that there is no air in system.

h. If pressure injection is to be done by automatic injector, performer prepares to coordinate injections with filming:

i) Checks that the automatic injector is loaded with proper amount of medium in syringe;

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checks that syringe is attached to injector tubing. Attaches tubing to catheter. Checks that there is no air in system.

ii) Performer checks on or orders the rate and pressure setting for the entry force for the automatic injector. Considers the force of entry needed to inject the contrast medium into the vessels of interest given the technique, vessel, route and other conditions involved.

9. Performer directs injection and filming:

   a. Performer may enter control room. Has patient hold steady on inspiration or perform Valsalva maneuver as rehearsed if conscious, or awaits indication from anesthesiologist that respiration has been suspended.
   b. If performer injects the contrast solution by hand, does so in predetermined amount decided; tells technologist when to activate the automatic film changer.
   c. If performer uses automatic injector, activates, and tells technologist when to start the automatic film changer to take the series of pre-programmed radiographs.
   d. May immediately inject saline to "push" injected contrast along.
   e. Has first set of serial films processed at once. While serial films are being processed, performer examines and talks to patient (if conscious) to evaluate how the patient has responded to the procedure and the injection.

      i) Detaches injector tubing; reflushes catheter or needle site.
      ii) If ECG is being monitored, evaluates any changes during initial

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injection as possible contraindication for additional injections.

10. Performer looks at the first set of serial angiograms on view boxes in sequence as soon as they are processed. Places biplane views together.

    a. Checks for technical quality, and notes whether any irregularities are due to artifacts or actual pathological or abnormal conditions, and whether the views are clear enough for medical interpretation. Performer may ask opinion of another radiologist.
    b. Determines whether the radiographs adequately demonstrate the vessels and structures being studied, and provide sufficient information about any pathology, blockage, or distoration of the flow, the presence of embolism, the extent and location of any anomalies, malformation, the presence of thrombi, and other signs of abnormal structure or pathology.
    c. Performer considers whether to inject additional contrast, repeat injection and filming with change in technical factors or patient position (such as oblique view).

       i) Performer may decide that the information suggests the need to do selective catheterization at a later time.
       ii) In deciding on additional injections performer considers the patient's condition, the contraindications, the information already supplied, and the urgency. May discuss with

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anesthesiologist, and/or cardiologist.

d. For additional injections, change of position, change in technical factors, performer reviews decisions on injection pressure, amount of contrast, rate and speed of serial programs,and exposure at appropriate phase of circulation.

  i) Indicates what is needed to staff and repeats as appropriate.
  ii) Allows appropriate elapse of time between injections for patient to respond optimally.
  iii) Performer reflushes periodically with saline and/or anticoagulant. Maintains check on condition of patient.

e. Repeats relevant steps for repeat or additional angiograms as decided and as described above until satisfied that the angiograms are technically adequate to demonstrate the areas and conditions under study and to provide sufficient information to make possible a competent medical interpretation or a surgical decision.
f. May decide to provide emergency care at any time throughout procedure if patient shows signs of adverse reactions.
g. If performer notes any signs of arterial or venous spasm, may inject an anticoagulant, and/or apply hot packs at once to avoid thrombotic occlusion.

11. Performer decides when the radiographic examination is completed based on information on the angiograms and the patient's condition. Informs anesthesiologist (if present), technologist, and other staff that procedure is to be terminated.

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a. Performer returns to the patient. If patient is conscious, performer reassures patient and explains what will happen next.
b. Removes any connecting tube or syringe.
c. Performer gently and slowly withdraws the needle, sheath or catheter. Manipulates catheter by turning and pulling carefully, taking care not to injure the vessel or enlarge the wound at the entry point.
d. Performer compresses the vessel proximal to or at the puncture site lightly with the fingertips and/or sterile gauze for an appropriate amount of time. Checks that there is no hematoma at the site.
e. Performer applies or orders pressure dressing to be kept in place appropriate amount of time.
f. Performer may order fluids to be given intravenously or by mouth. May order bed rest for appropriate period while patient recovers from effects of procedure.
g. Arranges to have puncture site examined regularly over the next few hours and any problems reported at once. Informs patient or attending staff to report further oozing of blood or swelling.
h. Performer may order careful observation of patient including vital signs, urinary output, and skin care. May order tests, fill out order forms. May order medication.
i. May order delayed urogram and/or chest film for appropriate amount of minutes after last injection.
j. Has appropriate sanitary clean up procedures carried out.

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k. If requested, calls surgeon or clinician and reports preliminary results and findings. 12. Performer records impressions of procedure on patient's chart: a. Preliminary findings. b. How patient tolerated procedure. c. Any special nursing follow-up recommended, tests, delayed films ordered, records and observation required, medication, later studies ordered. d. May sign chart, requisition sheet or order forms.	

TASK DESCRIPTION SHEET

Task Code No. 482

This is page 1 of 14 for this task.

1. What is the output of this task? (Be sure this is broad enough to be repeatable.)

Pt. examined,reassured;decisions made on going ahead, technique,puncture,injection sites,contrast,filming, type of injection;preparation ordered;site(s) anesthetized;vein(s) punctured;guide wire(s),catheter(s) advanced with fluoroscopy;test drugs injected;blood samples,circulation time,pressure taken;injection, filming coordinated;films evaluated;procedure continued;emergency care ordered;instruments removed; site compressed;orders for after care,tests,urography,medical impressions recorded.

2. What is used in performing this task? (Note if only certain items must be used. If there is choice, include everything or the kinds of things chosen among.)

X-ray requisition form;pt.'s medical chart,prior films,scans;pen;view boxes;sterile tray with antiseptic,saline,anticoagulant,dexrose,Decholin,hippuran,PAH solution,adrenal gland stimulant,test tubes, iced containers,vacutainers,syringes,venatubes,swabs, tape,scissors,gauze,pressure dressings,local anesthetic,Y-adaptor,needles,scalpels,guide wires,catheters, tourniquet;automatic injector;iodine-based contrast; x-ray table;serial cassette changer(s);fluoroscope, TV monitor;manometer;IV apparatus;emergency cart; sterile gown,gloves,drape;shielding

3. Is there a recipient, respondent or co-worker involved in the task? Yes...(✓) No...( )

4. If "Yes" to q. 3: Name the kind of recipient, respondent or co-worker involved, with descriptions to indicate the relevant condition; include the kind with whom the performer is not allowed to deal if relevant to knowledge requirements or legal restrictions.

Any pt.;authorized adult;attending MD;radiologist; surgeon;radiologic technologist;nurse

5. Name the task so that the answers to questions 1-4 are reflected. Underline essential words.

Conducting catheter vena cavography and/or selective renal or adrenal venography of any non-infant pt. by examining,reassuring pt.;obtaining consent;deciding on site,route,technique,prior preparation,whether to go ahead,type of injection,filming;injecting local anesthetic;making punctures;advancing catheter and guide wire with fluoroscopic control;injecting drugs for circulation time,function studies;taking pressure,blood samples;coordinating injection,filming; evaluating films;continuing;ordering emergency care; removing instruments;ordering after care,tests,delayed urography;recording orders,medical impressions.

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Performer receives the x-ray requisition form and medical chart of a non-infant patient scheduled for catheter inferior vena cavography and/or selective renal or adrenal venography (radiographic contrast study of inferior vena cava, and/or renal or adrenal veins by means of selective catheterization) prior to the procedure, such as on the previous day or evening.

1. Performer reads the patient's medical history and requisition form to review the case or to become familiar with materials seen earlier in consultation, in order to make decisions about the conduct of the radiographic study and to check on the request of the referring physician:
   a. Performer notes the patient's age, sex, weight, height, the name of the referring clinician or surgeon.
   b. Notes areas of interest, the purpose of the requested study, such as for information on the position and condition of the inferior vena cava prior to surgery, evidence of extrinsic pressure deformity, occlusive lesions, localization of thrombi, tumors, vein invasions of the renal or adrenal glands, sampling of renal venous blood (renal vein renin study), sampling of adrenal venous

OK-RP;RR;RR

6. Check here if this is a master sheet..(✓)

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blood. Notes nature and suspected location of expected pathology.

c. Notes whether inferior vena cavography is requested prior to renal or adrenal venography. Notes whether arterial phase is required to delineate position of the aorta. Notes whether bilateral catheterization is involved.

d. Performer reviews the diagnostic information already obtained, including any prior radiographic studies, radioisotope scans, ultrasonograms, results of clinical tests, lab and sensitivity tests, ECG (EKG), vital signs, clotting time tests.

e. Performer notes relevant prior history such as prior incidents of vascular constriction, removal of any section of the vascular system, grafts and their sites, history of heart disease, hypertension, renal, pulmonary, or liver disease, thrombosis, abnormal bleeding tendency, anticoagulation therapy, history of allergies or indications of allergy to iodine-based contrast media. Notes stage of female patient's menstrual cycle, any possibility of pregnancy, whether on oral contraceptive. Notes whether patient has an infectious or communicable condition, especially local infection at possible puncture site.

f. Notes whether there may be danger of intrinsic lesions of the inferior vena cava, danger of rupture of any vessels.

g. Notes whether prior orders have been given to improve patient's clinical condition; if so, notes progress.

h. Performer notes recommendations on method of examination, such as entry site and route for catheterization, site for injection (where catheter tip is to be placed), use of equipment and materials.

i. Checks to see whether patient or authorized adult has signed consent form. If not, may decide to obtain personally before sedation.

j. Performer may discuss case with referring clinician, specialist, or surgeon to obtain additional information. May arrange for attending physician and/or surgeon to accompany performer in examination of patient on day prior to the procedure.

2. Performer visits patient and any authorized adult at bedside or in appropriate location. May be accompanied by clinician, surgeon, or appropriate specialist.

a. Performer greets patient and/or authorized adult and explains that a brief examination will occur. If any colleagues are with performer, performer introduces them.

b. Performer reads patient's chart. Notes any new clinical developments, response to care or medication. May ask patient or accompanying adult about symptoms and allergies. Examines the patient for relevant symptoms and general state. Reassures and answers questions. If not already done, performer determines whether there is any possibility of pregnancy in the case of a female patient, whether patient has been taken off any oral contraceptive.

c. Performer considers whether there have been changes in the patient's condition since the decision was made to do the procedure, and considers whether there are contraindications to going ahead with the procedure. May confer with spe-

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cialist, clinician, or surgeon; discusses patient's current condition. Decides whether to proceed, cancel or delay procedure based on assessment of patient's current condition and any discussion.

d. If performer decides to proceed, examines patient to help determine appropriate site and method for introduction of catheter.

  i) Performer evaluates both femoral veins below the inguinal ligament. If bilateral catheterization is preferable, such as for blood sampling, determines condition of both entry sites.
  ii) Notes the presence of grafts, location of ischemic symptoms, local infection, tenderness or swelling. Considers the condition of the vessel, its ease of palpation, patient's clinical and surgical history, age of patient, and nature of symptoms. For unilateral catheterization selects right femoral vein if available or side most appropriate for the individual patient. Gives preference to right femoral vein.
  iii) For inferior vena cavography selects site for injection within inferior vena cava or common iliac vein as appropriate to the area(s) of interest.
  iv) For renal or adrenal venography, if bilateral study is required and only unilateral catheterization is possible, decides on sequence for catheterization, blood sampling and/or filming.
  v) Performer decides whether to use automatic and/or manual injection, single plane or biplane serial cassette changer.
  vi) Performer decides on catheter sizes, lengths and types as appropriate to the vessels to be catheterized. Decides on number and placement of side holes, preformed curves, tapering, use of catheter guidance system, type of safety guide wires.

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  vii) Decides on type of puncture needles, type and approximate amount of iodine-based contrast solution based on the patient's size, age, site of injection, and area of interest. Decides on local anesthetic.
  viii) Decides on materials appropriate for venous pressure reading, renal or adrenal blood sampling.

e. If performer decides not to have procedure done, may discuss with clinician. Records reasons for cancellation and any recommendations for alternative procedure on patient's chart. Informs staff of cancellation and discusses with patient.

f. Performer may decide to delay procedure, have patient undergo treatment to improve clinical condition, such as treatment for blood pressure, anemia, infectious condition, or malnutrition. Discusses as appropriate and has orders given for care of patient. If patient has been on anticoagulant therapy, may order cessation until prothrombin and/or clotting times are within normal levels. May order cessation of oral contraceptive if not already done. With emergency patient may determine whether delay is contraindicated.

g. If performer decides to proceed and a consent for the procedure has not been obtained, performer may explain to the patient or guardian in comprehensible language what will occur in the procedure, its purpose, and the dan-

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gers to the patient involved. Performer explains the alternatives; answers questions.

i) When the performer is sure that the patient understands the risks, asks the patient for signature on consent form and checks that it is properly signed.
ii) If a guardian is to sign, performer explains to the individual as appropriate.
iii) If a consent is not agreed to, performer postpones procedure until it is obtained. May discuss with appropriate physician or individuals and/or with patient. Does not proceed unless consent is obtained.

h. Performer decides on care to be provided for patient:

i) Performer makes final decisions on prior preparation of the patient such as sedation, period for withholding of food, hydration, use of prior IV drip, cleansing enema, shaving of entry site(s), prior administration of antihistamine, medications to deal with problems of blood clotting, fluctuations in blood pressure.
ii) May request EKG monitoring; may have arm-to-tongue circulation time tested and recorded or decides to do personally. May request assistant for bilateral blood sampling.

i. Performer records orders as appropriate so that patient and equipment can be prepared and staff assigned. May sign requisition; places for scheduling.

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j. May review with patient the procedures that will occur.

3. Just prior to the time for which the procedure is scheduled, the performer reviews all the relevant medical information and the patient's chart. Reviews relevant prior radiographs or scans. Notes any new developments.

a. Performer greets patient in examination room. May question about symptoms; reassures and explains what will occur.
b. Performer checks that all prior preparatory procedures have been carried out.

i) Checks report on electrolyte levels, blood clotting time, vital signs. Notes circulation time if recorded and relevant.
ii) Checks that any orders for hydration, prior administration of medication and/or sedation have been carried out, and at appropriate time. If not arranges to have these done and/or procedure delayed.

c. Performer examines puncture site (s) to review earlier decisions. Makes sure no swelling or tenderness is present. Considers alternative or unilateral puncture site if appropriate. Indicates final puncture site(s) to staff.
d. Performer may order scout film(s) of abdomen as appropriate for single or biplane views. Makes sure proper shielding is being used.

i) Performer places the processed scout films on view boxes and examines as soon as they are ready. Performer considers whether the areas of interest

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are visible, whether the technique is satisfactory, and whether the position(s) of the patient are correct.

ii) If the scouts are not satisfactory, performer indicates the needed changes in technique or in the patient's position to the radiologic technologist.

iii) Performer considers whether information on scouts suggests possible complications for catheterization or need for further cleansing. May order further cleansing, delay in procedure or makes last minute decision on catheterization site.

e. Performer considers whether patient's current condition presents any contraindications to going ahead with the procedure. May have clinician or specialist called; discusses patient's condition and any alternative steps. Decides whether to proceed or not based on need, evaluation of patient's condition and contraindications.

f. If performer decides not to proceed, records reasons and any recommendations on patient's chart. Informs appropriate co-worker of cancellation and has patient returned to room. If appropriate, orders rescheduling of patient or scheduling for alternative procedure.

4. If performer decides to proceed, continues with preparations:

a. For bilateral catheterization, if co-worker is to assist, indicates which steps are to be done by assistant, or decides on order of punctures for insertions of catheters (either right or left femoral). Performer handles one or

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both puncture sites as appropriate, one at a time, or in cooperation with the assistant.

b. Performer may explain or demonstrate use of equipment to a child to allay fears and enlist cooperation; answers questions. Explains that patient will be asked to hold still from time to time. Indicates what will happen, what pain might be experienced, and what cooperation will be needed. Stresses need to maintain positions when ordered.

i) For adrenal venography indicates that patient may experience some pain in the flank when the injection takes place. Reassures.

ii) If a Valsalva maneuver is to be used, performer demonstrates and rehearses patient in taking a deep breath, holding breath in, and bearing down as though evacuating until told to relax.

c. May order sedation if appropriate and not already administered. Has puncture site and possible alternative site shaved and prepared.

d. At appropriate time, depending on the nature of blood sampling study, performer sets up IV infusion.

i) For renal vein renin study checks prepared IV bottle containing solution of radioactive hippuran and PAH (para-aminohippuric acid, used to measure the effective renal plasma flow and to determine the functional capacity of the tubular excretory mechanism). Performer may decide to prepare IV bottle personally. For adrenal vein sampling may ar-

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range for injection of gland stimulant after control samples are taken.

- ii) Has IV infusion apparatus set up near patient. Attaches bottle of prepared solution to sterile IV tubing. Hangs at appropriate height on pole near patient with clamp in closed position.
- iii) Prepares patient for insertion of IV needle by exposing antecubital vein selected, applying tourniquet, and swabbing site with antiseptic solution. Inserts IV needle with sterile loop attached. Checks for blood; removes tourniquet. Tapes needle into position. May immobilize arm.
- iv) Runs fluid through tubing to check flow and remove air. Attaches loop of needle to IV tubing. Adjusts flow in tube to desired rate and starts infusion. Continues infusion throughout procedure. May check that rate is kept constant.
- v) Performer allows the infusion to progress for a proper elapse of time.

e. If not already done, performer may decide to test the arm-to-tongue circulation time in order to plan program for seriography so as to visualize the desired arterial phase.

- i) Has anticubital site prepared as described above, and assigns staff member to time response.
- ii) Indicates to patient that he or she must report the moment a bitter taste is detected on the tongue after injection of Decholin.
- iii) Checks prepared syringe of Decholin; may have tourniquet applied to expose prepared antecubital venous site.
- iv) Inserts needle into vein, checking location by aspirating slightly to note venous return. Then injects Decholin and has timing commence. Reminds patient to report bitter taste.
- v) Notes circulation time. Calculates proper program for seriography so that filming and planned injection of contrast will demonstrate the areas of interest as they are opacified.

f. Performer indicates any change in orders for sizes of needles, catheters, guide wires, type and amount of iodine-based contrast solution, use of automatic or manual injection, use of biplane or single plane serial changer.

g. Performer orders program for seriography allowing proper elapse of time to provide for the arterial phase if required.

- i) Informs technologist of the number of films to be taken, the per-second intervals, the number of series anticipated. Has equipment checked.
- ii) If a biplane study is involved, orders desired projections and/or angulation. Indicates whether biplane films will be taken simultaneously or sequentially.
- iii) Indicates stage of suspended respiration required or for filming.

h. Has technical factors set for fluoroscopy.

i. Informs appropriate co-workers of decisions so that patient and materials can be prepared.

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5. Performer returns to patient in procedure room when informed that patient and equipment are ready:

   a. Checks whether patient has been properly shielded, immobilized, and prepared for sterile puncture procedure. If not acceptable, indicates the needed adjustments. May decide to immobilize personally. Checks that ECG monitoring equipment is present (if ordered) and that emergency cart is present.
   b. Checks sterile tray prepared for procedure. Requests any missing objects.

      i) Performer checks that appropriate types and sizes of needles, catheters, and guide wires are present, that catheters are preformed as appropriate with side holes as ordered. Checks safety guide wires. May bend catheters personally.
      ii) Checks that syringes with saline and/or anticoagulant solution are prepared, that syringes with contrast medium, are ready.
      iii) Checks appearance of contrast medium to be sure there is no chemical deterioration; checks amount.
      iv) May prepare syringe with local anesthetic or checks.

   c. Checks that seriography equipment is ready for use, that technical factors are set for seriography and fluoroscopy, and that equipment for pressure injection (if ordered) is checked and ready for use.
   d. Dons protective lead garments and sterile gown and gloves when appropriate. Checks staff shielding.
   e. If patient is coherent, performer explains what will be done. Answers patient's questions as appropriate. Reassures patient and does so as deemed needed throughout procedure.

List Elements Fully

6. Unless already done, performer prepares the puncture site(s) for insertion of the needle and catheter(s) using sterile technique:

   a. Has patient positioned appropriately for the puncture site chosen so as to provide access, and locates the point of entry. For the femoral vein(s), has patient placed in supine position with access just below the inguinal ligament on the side(s) selected. May rotate thigh externally and abduct slightly. Locates the vessel by finding the proximal pulse of the femoral artery and palpating a point just medial at 5 to 8 cm. below Poupart's ligament.
   b. Prepares the site(s) for injection of the local anesthetic and puncture by swabbing with prepared antiseptic solution. Covers surrounding areas with sterile drapes, leaving only small area of injection and puncture uncovered.
   c. For each vein to be catheterized, checks amount of local anesthetic to be injected as shown by nurse in syringe, or draws anesthetic into sterile syringe. Checks that no air is present and inserts needle intradermally and subcutaneously; injects. Makes sure to infiltrate the skin and the sheath of the vein on both sides of the vessel. Removes needle. Waits for area to become anesthetized.

7. Performer uses Seldinger technique to catheterize the femoral vein(s) for bilateral catheterization. May enter

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by way of the femoral vein opposite the side of interest as follows:

a. When the entry area has become anesthetized performer makes sure that the entry site is optimally distended and prepares for puncture.
b. Chooses appropriate teflon puncture needle or needle with polyetheline tubing attached. Performer may use a scalpel to make a small incision at the entry site (to facilitate entry of needle).
c. Performer has patient hold still. Performer attempts to penetrate the vein (at the incision if created), while palpating and fixing vein. Performer inserts needle in the direction of flow.
d. Pulls out the needle's inner stylus; attaches vena tube or syringe to needle; suctions back and checks needle entry by noting whether venous blood appears. Removes vena tube or syringe. May pull back on needle and reinsert, or make other insertions until the needle tip is judged within the lumen of the vein.
e. May attach syringe with saline and/or anticoagulant to needle and flush entry site.
f. Performer may check position of needle at this point:

    i) Performer uses syringe prepared with a small amount of the contrast solution. Checks that medium is appropriate. Connects syringe to the catheter.
    ii) Positions the overhead fluoroscope unit over the patient; may have lights in room dimmed; activates the fluoroscope; adjusts technical factors or has this done.
    iii) Performer has patient hold still. Injects a small amount of

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the solution into the vein for viewing location of needle.
    iv) Locates site of entry and checks position of needle within vessel by viewing on TV monitor. Performer judges whether needle is correctly inserted in lumen of vessel rather than in an intramural or extravascular position by viewing on TV monitor and watching flow of test dose.
    v) Adjusts position of needle to be sure that the catheter will be free to pass along the lumen of the vessel.
    vi) With teflon needle performer removes stiff inner needle leaving teflon sheath in place. May advance sheath several inches into lumen of vessel in the direction of the route to be catheterized.

g. Performer inserts a curved tip safety guide wire into the needle or sheath and advances this into the vessel in the direction of the planned route for catheterization. May advance guide wire before removing needle or sheath and introducing catheter.
h. Once the guide wire is inserted, performer withdraws the needle or sheath, compressing the vein to reduce the bleeding. Cleans blood off guide wire. Inserts the appropriate size catheter by threading catheter over the guide wire and into the vein.

8. Performer advances the catheter(s) (with or without guide wire as a leader) under fluoroscopic control, as appropriate:

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a. Performer first advances guide wire and catheter to the iliac vein, under fluoroscopic control.

  i) Performer may inject test dose of contrast under fluoroscopic control as described above. Notes passage of contrast. Evaluates whether any thrombi will be encountered enroute in iliac vein or inferior vena cava, whether the projected route is patent. If route is obstructed or emboli are found, removes catheter as described below; selects alternative route and cares for puncture site.

  ii) In advancing catheter and guide wire, performer is careful not to force passage.

  iii) If an obstacle is encountered, performer checks position using fluoroscopy, syringe, and small amount of contrast solution (as described above). Injects a small amount of contrast into the vein through the catheter; activates fluoroscope and views on the TV monitor. Determines problem and redirects guide wire or catheter as appropriate. Performer evaluates entry route if appropriate and may choose opposite vein, sequential bilateral catheterization or decides to terminate. Performer repeats appropriate steps for any new location after properly caring for initial site.

  iv) If entry or placement cannot be easily accomplished, performer may decide to terminate so as to avoid further trauma to vessels. If so, performer records as appropriate and informs staff. May arrange for rescheduling.

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b. If performer is to do inferior vena cavography, advances catheter tip to the desired site for injection as described. May position catheter tip over the first lumbar vertebra, with the first side hole of catheter at a level opposite the "take-off" of the right renal vein. Checks position with test dose as described above.

c. If performer is to carry out renal venography without prior inferior vena cavography, performer advances catheter tip(s) to the inferior vena cava,to the orifice of the left and/or right renal vein. Uses fluoroscopic control:

  i) For bilateral catheterization advances catheter from left femoral vein to right renal vein, or plans order of sequence using one catheter.

  ii) For right renal vein, advances catheter tip in vena cava above the first lumbar vertebra and then retracts tip so that it enters the right renal vein.

  iii) For left renal vein, advances catheter in vena cava to the level of the first or second lumbar intervertebral space and enters left renal vein.

  iv) Performer uses test injections to evaluate placement of catheter(s) and to judge the amount of contrast needed based on the extent to which the venous flow is diminished by occlusive disease.

d. If performer is to carry out adrenal venography without prior inferior vena cavography, performer advances catheter tip(s) to the inferior vena cava under fluoroscopic control:

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i) Uses catheter(s) appropriate to the side(s) of interest and preforms if needed. May insert guide wire, remove original catheter while compressing the vein, and reinsert special catheter for the side of interest. For simultaneous bilateral catheterization inserts each catheter from opposite side.

ii) For right adrenal vein advances catheter in inferior vena cava to the level of the twelfth thoracic vertebra, at the widest part of the inferior vena cava, on the right side of the dorsal wall, above the right renal vein.

iii) For left adrenal vein advances the catheter into the left renal vein as described above. Then advances catheter along renal vein to the orifice of the adrenal vein. Places catheter tip beyond the junction with the inferior phrenic vein.

iv) Performer checks location of catheter tip(s) and judges amount of contrast and appropriate hand pressure, using small amounts of contrast in test injections. Is careful to use gentle pressure. Repositions catheter at once if there is any indication that the vessel is being occluded by the catheter.

e. Removes guide wire(s) if not already done.

f. Performer may use IV infusion of dextrose and water to keep catheter(s) flushed, saline, and/or anticoagulant in bottle(s) hung at appropriate height on IV apparatus. Attaches IV bottle(s) to sterile IV tubing with clamps in closed position. Runs fluid through tubings to check flow and remove air. Attaches IV tubing from a bottle to each of the catheters. Adjusts drips to desired rate and starts infusion by opening clamps. Continues IV infusion for catheter(s) unless in use for other purpose.

g. If venous pressure is to be recorded, attaches manometer to the catheter; observes and records pressure and location or has this done.

9. Performer decides on the appropriate time to take renal or adrenal blood samples for the study if appropriate:

a. Instructs co-worker to prepare for two sets of blood samples and proper disposition. Checks that test tubes are prepared for the samples with anticoagulant, and checks that test tubes and iced containers to transport samples are ready for use. Makes sure that proper labels will be used to designate the patient's identification, the exact source of the blood, and control samples if appropriate.

b. For adrenal vein sampling may first take "control" samples before introducing gland stimulants. Then injects appropriate stimulant such as angiotensin or adrenocorticotropic hormone as appropriate. Waits proper amount of time and takes adrenal vein samples again.

c. Performer indicates to designated co-worker when blood specimens are to be taken simultaneously from the two catheters inserted into the renal or adrenal veins. (Performer and co-worker carry out the following procedures simultaneously, one for each catheter. If only one vein has been catheterized, performer performs in sequence

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after catheter has been moved from one renal or adrenal vein to the other.):

i) Performer clamps catheter(s) and removes IV tube(s) connected to solution used to flush catheter (s).
ii) Performer opens each catheter clamp and allows blood to pass from catheter to test tube. Performer fills two test tubes; clamps catheter; seals test tubes; has test tubes labeled and inserted in iced containers.
iii) Performer reattaches tube from IV bottle to catheter and unclamps catheter.

d. Performer may take samples from a peripheral arm vein to be used for comparison with blood samples taken from catheter(s).

i) Has test tubes prepared for blood samples from a peripheral arm vein and/or checks that materials are ready. Performer decides whether to take blood samples personally or have this done. Indicates vein chosen.
ii) If performer takes samples, prepares arm with tourniquet, swabs with antiseptic, inserts syringe or vacutainer needle. Checks for blood; removes tourniquet.
iii) Draws blood into syringe or vacutainer in amounts required to fill two test tubes. Removes needle; swabs puncture; compresses.
iv) Has test tubes filled and/or properly labeled, and placed in containers to be used for comparison.

e. Performer examines patient to see how he or she is responding to procedure. Unless performer decides

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that patient can no longer tolerate procedure, performer proceeds. If necessary, prescribes immediate care and has procedure terminated. Records.

10. Performer prepares for injection of contrast and filming:

a. Performer has patient and x-ray tube(s) positioned for AP and lateral projections depending on side of interest, with biplane cassette changer if available. May order right posterior oblique projection. Makes sure proper (close) collimation to area of interest will be observed. Checks patient and staff shielding.
b. Performer reviews with technologist the program for seriography; the rate, length of time and intervals for exposures, the coordination with injection and phases of circulation to be visualized.
c. May rehearse patient in suspending and holding breath on inspiration. If a Valsalva maneuver is to be used, performer demonstrates and rehearses patient in taking a deep breath, holding breath in, and bearing down as though evacuating until told to relax.
d. For bilateral injection attaches "Y" adaptor to catheters.
e. If pressure injection is to be done by hand, performer prepares or checks syringe(s) with the iodine-based, aqueous contrast solution for quantity selected.
f. If pressure injection is to be done by automatic injector:

i) Checks that the automatic injector is loaded with selected amount of medium in syringe(s); checks that syringe(s) are attached to injector tubing.

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  ii) Performer checks on or orders the rate and pressure setting for the entry force for the automatic injector. Considers the force of entry needed to inject the contrast medium into the vessel(s) of interest given the technique, vessel(s), and other conditions involved.

g. Disconnects catheter(s) from the IV tubing; attaches catheter(s) to injector tubing or syringe(s). Checks that there is no air in the system.

11. Performer directs injection and filming:

    a. Alerts patient to hold steady on inspiration or perform Valsalva maneuver as rehearsed when given signal.
    b. If performer injects the contrast solution by hand, does so in predetermined amount, with gentle pressure as decided; tells technologist when to activate the automatic film changer and gives signal to patient.
    c. If performer uses automatic injector, activates; tells technologist when to start the automatic film changer and gives signal to patient.
    d. Has first set of serial films processed at once.
    e. While serial films are being processed, performer examines and talks to patient to evaluate how the patient has responded to the procedure and the injection.

       i) Detaches injector tubing; reflushes catheter(s).
       ii) If EKG is being monitored, evaluates any changes during initial

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injection as possible contraindication for additional injections.

       iii) For adrenal venography comforts patient if any flank pain occurs.
       iv) If performer notes any signs of vascular spasm, may inject an anticoagulant, and/or apply hot packs at once to avoid thrombotic occlusion.

12. Performer looks at the first set of serial angiograms on view boxes in sequence as soon as they are processed. Places biplane views together.

    a. Checks for technical quality, and notes whether any irregularities are due to artifacts or actual pathological or abnormal conditions, and whether the views are clear enough for medical interpretation. Performer may ask opinion of another radiologist.
    b. Determines whether the angiograms adequately demonstrate the vessels and structures being studied, and provide sufficient information about any pathology, blockage, or distortion of the flow, the extent and location of any anomalies, malformation, the presence of aneurysms, and other signs of abnormal structure or pathology.
    c. With inferior vena cavograms, performer may determine whether the position of the aorta has been visualized, whether the orifices of the renal veins have been adequately opacified, whether there has been visualization of the position of the adrenal glands.
    d. Performer considers whether to inject additional contrast, repeat injection and filming with change in technical factors or patient position (such as for oblique view).

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e. Performer may evaluate the details of the angiograms to use as a "roadmap" for selective catheterization of the renal or adrenal vein(s) (if not already done).

f. In deciding whether to repeat examination or proceed with selective catheterization, performer considers the patient's condition, the contraindications, the information already supplied, and the urgency. May discuss with colleague.

g. For additional injections, change of position, change in technical factors, performer reviews decisions on injection pressure, amount of contrast, rate and speed of serial programs; indicates what is needed to staff and repeats as appropriate. Allows appropriate elapse of time between injections for patient to respond optimally.

13. If selective renal or adrenal venography is to be done after the inferior vena cavography, performer inserts guide wire until it reaches the proximal catheter tip. Uses fluoroscopic control.

   a. Performer may remove original catheter and thread a specially formed catheter over the guide wire as described. Advances catheter (with guide wire as leader if so decided) into appropriate location as described above.
   b. Uses information on vena cavograms to locate orifices of renal or adrenal glands. If the adrenal glands have been localized, performer searches for the right adrenal vein along the posterolateral wall of the inferior vena cava at the level of the gland.
   c. For sequential bilateral catheterization performer may withdraw catheter from side already opacified into the inferior vena cava and reposition as described above.
   d. Uses fluoroscopy and test dose to check placement.
   e. Performer reflushes the catheter(s) periodically or continue with IV drip(s). Maintains check on condition of patient. Allows appropriate period of time between injections for reactions to contrast to dissipate.
   f. Repeats relevant steps for repeat or additional angiograms as decided and as described above until satisfied that the angiograms are technically adequate to demonstrate the areas and conditions under study and to provide sufficient information to make possible a competent medical interpretation or a surgical decision.

14. Throughout procedure performer evaluates how the patient is responding. May decide to provide emergency care at any time if patient shows signs of adverse reactions.

15. Performer decides when the radiographic examination is completed based on information on the angiograms and the patient's condition. Informs technologist and other staff that procedure is to be terminated.

   a. Performer returns to the patient. Reassures and explains what will happen next.

      i) Has any IV apparatus removed from patient.
      ii) Removes any connecting tube or syringe from catheter(s).

   b. Performer gently and slowly withdraws each catheter. Manipulates

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catheter by turning and pulling carefully, taking care not to injure the vessel or enlarge the wound at the entry point.

c. Performer compresses the vessel proximal to or at the puncture site lightly with the fingertips and/or sterile gauze for an appropriate amount of time. Checks that there is no hematoma at the site.

d. Performer applies or orders pressure dressing to be kept in place appropriate amount of time.

e. Performer may order fluids to be given intravenously or by mouth. May order bed rest for appropriate period while patient recovers from effects of procedure.

f. Arranges to have puncture site examined regularly over the next few hours and any problems reported at once. Informs patient or attending staff to report further oozing of blood or swelling. Explains possible side effects of adrenal injection.

g. Performer may order careful observation of patient including vital signs, urinary output, and skin care. May order tests, fill out lab order forms. May order medication.

h. May order delayed urography for appropriate amount of minutes after last injection.

i. Has appropriate sanitary clean up procedures carried out.

j. If requested, calls surgeon or clinician and reports preliminary results and findings.

16. Performer records impressions of procedure on patient's chart:

a. Preliminary findings, tests performed, blood samples taken and location.

b. How patient tolerated procedure.

c. Any special nursing follow-up recommended, tests, delayed films ordered, records and observation required, medication, later studies ordered.

d. May sign chart, requisition sheet or order forms.

TASK DESCRIPTION SHEET

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1. What is the output of this task? (Be sure this is broad enough to be repeatable.)

Pt. examined, reassured; decisions made on going ahead, route, technique, site of puncture, contrast medium, type of injection, filming, prior preparation; site anesthetized; artery punctured; guide wire, catheter advanced under fluoroscopic control, pressure and EKG monitoring to ascending aorta, left ventricle and/or left, right coronary artery; injection and filming coordinated; angiograms reviewed, continued; assistance given in emergency care; instruments removed; site compressed; orders for after care, tests, urogram, medical impressions recorded.

2. What is used in performing this task? (Note if only certain items must be used. If there is choice, include everything or the kinds of things chosen among.)

X-ray requisition form; pt.'s medical chart, prior films, scans; pen; view boxes; sterile tray with antiseptic, saline, anticoagulant, vasodilator, swabs, tape, scissors, gauze, pressure dressings, local anesthetic, syringes, puncture needle, scalpels, dilator, guide wires, catheters; automatic injector; iodine-based contrast; x-ray table; serial film changer; fluoroscope, TV monitor; cine camera; videotape; cardiac, pressure monitors; emergency cart; sterile gown, gloves, drape; shielding

3. Is there a recipient, respondent or co-worker involved in the task? Yes...(X) No...( )

4. If "Yes" to q. 3: Name the kind of recipient, respondent or co-worker involved, with descriptions to indicate the relevant condition; include the kind with whom the performer is not allowed to deal if relevant to knowledge requirements or legal restrictions.

Any pt.; authorized adult; attending MD; radiologist; anesthesiologist; surgeon; radiologic technologist; nurse; cardiac team; cardiologist

5. Name the task so that the answers to questions 1-4 are reflected. Underline essential words.

Conducting percutaneous coronary arteriography and/or left ventriculography of any pt. by examining, reassuring pt.; obtaining consent; deciding on route, technique, prior preparation, whether to go ahead, type of injection, filming; injecting local anesthetic; making puncture; advancing catheter and guide wire under fluoroscopic control to ascending aorta, left ventricle, left, right coronary arteries as decided while checking pressure, ECG and test dose response; coordinating injection and filming; evaluating; continuing; assisting with emergency care; removing instruments; ordering after care, tests, delayed films; recording orders, medical impressions.

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Performer receives the x-ray requisition form and medical chart of a patient scheduled for left ventriculography and/or coronary arteriography (radiographic contrast study of the left ventricle of the heart and/or coronary arteries by means of percutaneous catheterization) prior to the procedure, such as on the previous day or evening.

1. Performer reads the patient's medical history and requisition form to review the case or to become familiar with materials seen earlier in consultation, in order to make decisions about the conduct of the radiographic study and to check on the request of the referring physician:
   a. Performer notes the patient's age, sex, weight, height, the name of the referring clinician or surgeon.
   b. Notes the purpose of the requested study, such as for information prior to surgery, preliminary or supplementary diagnosis such as angina pectoris, coronary disease, congenital lesions, valvular disease, ventricular septal or filling defects, anatomic and/or hemodynamic abnormalities of the coronary arteries and/or ventricle, or post operative evaluation of therapeutic surgery. Notes the nature

OK-RP; RR; RR

6. Check here if this is a master sheet..(X)

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and location of the suspected pathology, duration and severity of known coronary disease symptoms. Notes side of interest, whether selective or nonselective coronary arteriography and/or left ventriculography has been requested.

c. Performer notes relevant prior history such as vascular constriction, chest pain, atherosclerosis, rheumatic heart disease, emboli, removal of any section of the vascular system, bypass grafts and their sites, history of heart, renal, pulmonary, or liver disease, history of allergies or indications of allergy to iodine-based contrast media, abnormal bleeding tendency, anticoagulation therapy.

d. Performer reviews the diagnostic information already obtained, including any prior radiographic studies, radioisotope scans, ultrasonograms, results of clinical exercise tests, lab and sensitivity tests, EKG(ECG), vital signs. If already done, notes results of allergy test, clotting time tests; notes stage of female patient's menstrual cycle, any possibility of pregnancy, whether on oral contraceptive. Notes if patient has infectious or communicable condition, especially at possible puncture site.

e. Notes whether prior orders have been given to improve patient's clinical condition; if so, notes progress.

f. Performer notes recommendations on technique, such as use of equipment and materials, prior medication, use of general or local anesthesia.

g. Checks to see whether patient or authorized adult has signed consent for procedure. If not, may decide to obtain personally before sedation.

h. Performer may discuss case with referring clinician, cardiologist, or surgeon to obtain additional information. May arrange for attending physician, anesthesiologist, cardiologist and/or surgeon to accompany performer in examination of patient on day prior to the procedure.

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2. Performer visits patient and any authorized adult at bedside or in appropriate location. May be accompanied by clinician, anesthesiologist, surgeon, or cardiologist.

    a. Performer greets patient and/or authorized adult and explains that a brief examination will occur. If any colleagues are with performer, performer introduces them.

    b. Performer reads patient's chart. Notes any new clinical developments, cardiovascular status, response to care or medication. May ask patient or accompanying adult about symptoms and allergies. Examines the patient for relevant symptoms and general state. Reassures and answers questions. If not already done, performer determines whether there is any possibility of pregnancy in the case of a female patient, whether patient has been taken off any oral contraceptive.

    c. Performer considers whether there have been changes in the patient's condition since the decision was made to do the procedure, and considers whether there are contraindications to going ahead with the procedure. May confer with cardiologist, clinician, or surgeon; discusses patient's current condition. Decides whether to proceed, cancel, or delay procedure based on assessment of

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patient's current condition and any discussion.

d. If performer decides to proceed, examines femoral arterial pulses to determine best entry site:

   i) Notes strength and expansive nature of the pulsations, presence of bruits (murmurs), presence of grafts, presence and location of ischemic symptoms, local infection. Reviews recommendations.
   ii) Performer considers the condition of the pulses, location of the pathology, areas of interest, clinical and surgical history, age of patient and nature of symptoms.
   iii) Selects side and puncture site considering condition of area and patient's age. Avoids puncture site where there is severe atherosclerotic involvement, scars or grafts. Favors right femoral artery unless the pulse on that side is weak.
   iv) Performer examines and records presence and character of pulses at, and distal to, the artery to be punctured.

e. If performer decides not to have procedure done, may discuss with cardiologist or clinician. Records reasons for cancellation and any recommendations for alternative procedure on patient's chart. Informs staff of cancellation and discusses with patient.

f. Performer may decide to delay procedure, have patient undergo treatment to improve clinical condition, such as treatment for blood pressure, anemia, infectious condition, or malnutrition. Discusses as appropriate and has orders given for care of patient.

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If patient has been on anticoagulant therapy, may order cessation until prothrombin and/or clotting times are within normal levels. May order cessation of oral contraceptive if not already done. With emergency patient may determine whether delay is contraindicated.

g. If performer decides to proceed and a consent for the procedure has not been obtained, performer may explain to the patient or guardian in comprehensible language what will occur in the procedure, its purpose, and the dangers to the patient involved. Performer explains the alternatives; answers questions.

   i) When the performer is sure that the patient understands the risks, asks the patient for signature on consent form and checks that it is properly signed.
   ii) If a guardian is to sign, performer explains to the individual as appropriate.
   iii) If a consent is not agreed to, performer postpones procedure until it is obtained. May discuss with appropriate physician or individuals and/or with patient. Does not proceed unless consent is obtained.

h. If performer decides to proceed, decides whether to start procedure with nonselective coronary arteriography, whether to precede selective coronary arteriography with left ventriculography, based on information needed and patient's age and condition.

i. Performer makes preliminary decisions on materials and equipment:

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i) Decides on the variety of catheter types, sizes, and lengths to have available, whether radiopaque or radiolucent, with or without sideholes, based on injection sites; may order preformed right and left coronary catheters, loop catheters and pigtail catheters.

ii) Decides on type of safety guide wires such as teflon, j-shaped.

iii) Decides on iodine-based contrast solution with sodium content appropriate to the type of examination involved, avoiding high sodium content, especially for patient with severe heart disease. Selects appropriate physiological solutions for flushing.

iv) Performer orders serial cassette changer and/or cineradiography equipment depending on purpose of study. If ventriculography will be carried out, may order biplane equipment. If cine filming will be done may also order video equipment.

v) Performer orders manual injection equipment; may order automatic pressure injection equipment for ventriculography.

vi) Performer may order a vasodilator, such as atropine and local anesthetic as appropriate.

j. Performer decides on care to be provided for patient:

i) Decides on use of general and/or local anesthetic. May discuss with anesthesiologist. If a general anesthetic is to be administered, performer arranges to have staff ready at the appropriate time.

ii) Decides on prior preparation of the patient such as sedation,

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period for withholding of food and/or drink, or hydration, as appropriate, use of prior IV drip. May order prior administration of antihistamine, appropriate medication to deal with problems of blood clotting, fluctuations in blood pressure, based on patient's condition and contraindications.

iii) Orders cardiac team to monitor ECG, vital signs, arterial and cardiac pressure.

iv) Makes sure room will have monitoring and emergency life support equipment, including EKG and pressure monitors, electric defibrillator.

k. Performer records orders as appropriate so that patient and equipment can be prepared and staff assigned. May sign requisition; places for scheduling.

l. Reviews with patient the procedures that will occur.

3. Just prior to the time for which the procedure is scheduled, the performer reviews all the relevant medical information and the patient's chart, especially current cardiovascular status. Reviews relevant prior radiographs or scans and ECG readings. Notes any new developments.

a. Performer greets patient in examination room. May question about symptoms; reassures and explains what will occur.

b. Performer checks that all prior preparatory procedures have been carried out.

i) Checks report on electrolyte levels, blood clotting time,

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vital signs. Checks with cardiac monitoring team.

- ii) Checks that any orders for hydration, starting of IV infusion, prior administration of medication, vasodilator and/or sedation have been carried out, and at appropriate time. If not, arranges to have these done and/or procedure delayed.

c. Performer examines puncture site to review earlier decisions. Makes sure no swelling or tenderness is present. Considers alternative puncture site if appropriate. Indicates final puncture site to staff.

d. Performer may order scout film(s) of chest as appropriate for single or biplane views, including PA projection. Makes sure proper shielding is being used.

- i) Performer places the processed scout film(s) on view boxes and examines as soon as processed. Considers whether the areas of interest are visible, whether the technique is satisfactory, and whether the position(s) of the patient are correct.
- ii) If the scout(s) are not satisfactory, performer indicates the needed changes in technique or in the patient's position to the radiologic technologist.
- iii) Performer evaluates the PA projection to estimate the size of the aorta at the aortic root. Performer makes final decision on the coronary catheters based on the patient's size, age, known valvular disease and the appearance of the aorta on the scout(s).
- iv) Notes any other information affecting route for catheterization or patient's current condition.

e. Performer considers whether patient's current condition presents any contraindications to going ahead with the procedure. May discuss with cardiologist; discusses patient's condition and any alternative steps. Decides whether to proceed or not based on need, evaluation of patient's condition and contraindications.

f. If performer decides not to proceed, records reasons and any recommendations on patient's chart. Informs appropriate coworker of cancellation and has patient returned to room. If appropriate, orders rescheduling of patient or scheduling for alternative procedure.

g. If patient is pediatric patient or if general anesthesia has been suggested for adult, performer may reconsider whether general anesthesia is still warranted; may decide to order if patient's behavior and condition suggest the need. If general anesthesia is to be carried out, performer discusses with anesthesiologist when it is to be administered and plans to coordinate with anesthesiologist and cardiac team.

h. May order sedation and/or IV drip if appropriate and not already administered. Has puncture site and possible alternative site shaved and prepared. If vasodilator is to be administered, times administration for optimal effect in procedure.

i. Performer may explain or demonstrate use of equipment to a child to allay fears and enlist cooperation; answers questions.

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Explains that patient will be asked to hold still from time to time. Indicates what will happen, what pain might be experienced, and what cooperation will be needed, Stresses need to maintain positions when ordered.

4. Performer makes final decisions on technique and surgical procedures:

   a. Decides on order of events such as nonselective coronary arteriography, left ventriculography, left coronary arteriography, right coronary arteriography.
   b. Reviews ECG and pressure monitoring and reporting sequences with cardiac team. Makes sure ECG and pressure monitoring staff will alert performer at first sign of damping or nonnormal ECG reading. Makes sure equipment is operating properly and all on team are present.
   c. Orders or checks types, sizes, shapes and lengths of catheters for each stage of examination, safety guide wires, and type of contrast material. May adjust shape of guide wires and catheters. Orders sizes and types of needles, local anesthetic.
   d. Performer indicates whether cineradiography and video will be used, whether single or biplane. Orders exposure rate (frames per second). Has technical factors set for fluoroscopy.
   e. Performer indicates whether serial radiography will be used, whether single or biplane. For each area of interest decides on program for seriography, and proper elapse of time to provide for the circulatory stages of interest. Informs technologist of the number of films to be taken, the per-second intervals, and the number of series anticipated. If a biplane study is involved, indicates desired projections and/or angulation. Indicates whether biplane films will be taken simultaneously or sequentially.
   f. Orders type(s) of injection equipment, manual and/or automatic.
   g. Makes sure that all equipment and monitoring devices are checked. Makes sure that emergency cart with defibrillator equipment is present, that specialist in emergency life support, such as cardiologist, is present or on call.
   h. If general anesthesia is to be administered, indicates to anesthesiologist when procedure is to start and allows for appropriate timing.
   i. Informs appropriate co-workers of decisions so that patient and materials can be prepared.

5. Performer returns to patient in procedure room when informed that patient and equipment are ready:

   a. Checks whether patient has been properly shielded, immobilized, and prepared for sterile puncture procedure. If not acceptable, indicates the needed adjustments. May decide to immobilize personally.
   b. Checks that cardiac team is in place to monitor ECG, take pressure readings, monitor IV, and provide emergency care. Checks that emergency equipment is present.
   c. Checks sterile tray prepared for procedure. Requests any missing objects:

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i) Performer checks that appropriate types and sizes of needles, catheters, and safety guide wires are present, that catheters are preformed as appropriate.

ii) Checks that syringes with saline and/or anticoagulant solution are prepared, that syringes with contrast medium, are ready.

iii) Checks appearance of contrast medium to be sure there is no chemical deterioration; checks amount.

iv) May prepare syringe with local anesthetic or checks.

d. Checks that seriography, and/or cine and video equipment is ready for use, that technical factors are set for seriography and fluoroscopy, and that equipment for hand and/or pressure injection is checked and ready for use.

e. Dons protective lead garments and sterile gown and gloves when appropriate. Checks staff shielding.

f. If patient is coherent, performer explains what will be done. Answers patient's questions as appropriate. Reassures patient and does so as deemed needed throughout procedure.

g. If general anesthesia is to be administered, checks with anesthesiologist to be sure that the patient is ready for procedure to begin.

6. Unless already done, performer prepares the puncture site in femoral artery for insertion of the needle and catheter using sterile technique:

a. Has patient lie supine on table with legs positioned for access on side of interest below the inguinal ligament, as high as possible, but allowing for later compression of the vessel proximal to the puncture site.

b. Performer locates the vessel for puncture visually and/or by feeling for arterial pulsation in the location selected. May choose more palpable position in vessel allowing for later compression.

c. Prepares the site for injection of the local anesthetic and puncture by swabbing with prepared antiseptic solution. Covers surrounding areas with sterile drapes, leaving only small area of injection and puncture uncovered.

d. Checks amount of local anesthetic to be injected as shown by nurse in syringe, or draws anesthetic into sterile syringe. Checks that there is no air, and inserts needle intradermally and subcutaneously; injects. Makes sure to infiltrate the skin and the sheath of the artery on both sides of the vessel. Removes needle. Waits for area to become anesthetized.

7. Performer proceeds with "Seldinger" catheterization as follows:

a. If patient is conscious, explains when patient is to hold steady for puncture.

b. Performer feels for the arterial pulse by palpating with fingers. Makes an incision or nick through the skin with a sterile scalpel at the site where the needle and catheter will enter.

c. Performer inserts puncture needle tip (appropriately sized hollow needle with sharp cutting inner stylus or teflon needle tip

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equipped with stylet and teflon sheath) into the incision while palpating and fixing the artery. Performer angles needle to enter along the lateral side of the vessel with the tip directed along the course of the artery. May attempt to enter only the anterior arterial wall.

d. Performer pulls out the needle's inner stylus and withdraws the needle slowly until a characteristic "pop" is felt and a vigorous jet of arterial blood is obtained. May pull back on needle, reinsert, or make other incisions until artery is successfully entered.

   i) With teflon needle performer removes stiff inner needle leaving teflon sheath in place.
   ii) May advance needle or sheath several inches into lumen of vessel in the direction of the route to be catheterized.

e. Performer inserts a curved tip teflon safety guide wire into the needle or sheath and advances this into the vessel in the direction of the planned route for catheterization.

   i) May decide to advance guide wire before removing needle or sheath and introducing catheter.
   ii) May attach adaptor with syringe containing physiologic solution and/or contrast to prevent loss of arterial blood.

f. Performer may check position of needle and/or guide wire at this point:

   i) Performer uses syringe prepared with a small amount of the contrast solution. Checks that medium is appropriate. Connects syringe to the adaptor on catheter if not already done.
   ii) Positions the overhead fluoroscope unit over the patient; may have lights in room dimmed; activates the fluoroscope; adjusts technical factors or has this done.
   iii) Performer has patient hold still. Injects a small amount of the solution into the artery for viewing location of needle tip and guide wire.
   iv) Locates site of entry and checks position of needle and/or guide wire within vessel by viewing on TV monitor. Performer judges whether guide wire is correctly inserted in lumen of vessel rather than in an intramural or extravascular position by viewing on TV monitor and watching flow of test dose.
   v) Adjusts position of guide wire to be sure that it is free to pass along the lumen of the vessel.
   vi) If performer judges that entry through the femoral site chosen cannot be properly accomplished, performer may decide to enter from the opposite artery. If so, performer repeats appropriate steps for new location after caring for initial site.

g. Performer advances the guide wire under fluoroscopic control into the iliac artery and to a point above the aortic bifurcation in the descending aorta.

   i) In advancing the guide wire, performer is careful not to

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force passage. May check that there is free passage of blood when syringe is removed.

- ii) If an obstacle is encountered, performer checks position using fluoroscopy, syringe, and small amount of contrast solution (as described above). Injects a small amount of contrast into the artery through the sheath or needle; activates fluoroscope, and views on the TV monitor. Determines problem and redirects guide wire as appropriate.
- iii) If performer has difficulty advancing guide wire, may remove the guide wire and insert a j-tip safety guide wire.
- iv) Performer evaluates entry route if appropriate and may choose opposite side or alternative route. Performer repeats appropriate steps for any new location after properly caring for initial site.
- v) If entry or placement cannot be easily accomplished, performer may decide to terminate so as to avoid further trauma to vessels. If so, performer records as appropriate and informs staff. May arrange for rescheduling.

h. Once the guide wire is inserted, performer withdraws the hollow needle or sheath, compressing the artery to reduce the bleeding. Cleans blood off guide wire. Inserts the catheter appropriate for first injection by threading catheter over the guide wire and into the artery to the proximal end of guide wire.

- i) If performer will be doing nonselective coronary arteriography, inserts appropriate loop catheter.

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- ii) If performer will be doing left ventriculography followed by selective coronary arteriography, advances the catheter selected such as pigtail catheter.
- iii) If performer will be doing selective coronary arteriography first, performer may first advance a short segment of catheter to be used as a dilator. Advances over guide wire appropriate distance as described. Performer then removes dilator while compressing the artery, and inserts appropriate (left) coronary catheter to the proximal end of the guide wire.
- iv) Performer attaches syringe prepared with physiological solution of saline and/or an anticoagulant to adaptor on catheter. Flushes catheter periodically to avoid clotting and to keep catheter clear.
- v) Performer may attach syringe with contrast solution to adaptor on catheter for test doses and to opacify, if catheter is radiolucent.

i. Under fluoroscopic control, performer advances the guide wire and catheter up the aorta until they reach the distal part of the aortic arch.

j. Performer holds the guide wire stationary and advances catheter to a relaxed position in the aortic arch.

- i) May check location of catheter using test dose and fluoroscopic control. Performer removes guide wire if not already done.
- ii) If catheter is not radiopaque, and if not already done, performer fills the catheter with

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contrast agent using syringe attached to adaptor.

k. Performer may have manometer attached to catheter, and/or arranges to have pressure readings at catheter tip taken and reported periodically. Checks ECG reading.

  i) Has staff report any unusual pressure or ECG readings at once.
  ii) If any damping of pressure is reported, performer moves catheter at once to avoid leaving catheter in wedged position.

8. If performer is to begin procedure with nonselective coronary arteriography, proceeds as follows:

  a. Performer places catheter so that loop is in the region above the aortic valve.
  b. Performer checks position using a small forceful hand injection as test dose. Notes whether catheter position is stable. Notes whether "washout" of contrast is rapid. If not, repositions catheter until it is in a clear position.
  c. Performer has table positioned as appropriate for projections desired. Has cassette changers brought into position and/or sets up fluoroscope unit for cine filming, and videotape recording from TV fluoroscopic image.
  d. Chooses amount of contrast solution based on size of patient.
  e. If contrast injection is to be done by hand, performer prepares or checks syringe with the iodine-based aqueous contrast solution for correct quantity and no air.
  f. If pressure is to be done by automatic injector, performer prepares to coordinate injection with filming:

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    i) Checks that the automatic injector is loaded with proper minimum amount of medium in syringe; checks that syringe is attached to injector tubing. Attaches tubing to catheter. Checks that there is no air in system.
    ii) Performer determines, sets, or orders the rate and pressure setting for the entry force of the automatic injector. Considers the force of entry needed to inject the contrast medium into the vessels, given the vessels and other conditions involved.

  g. Has EKG and pressure recorded during injection and exposure.
  h. Has patient hold steady, if conscious, or awaits indication from anesthesiologist that respiration has been suspended.
  i. With serial filming, performer tells technologist when to start serial cassette changer, and activates automatic injector or injects by hand, with syringe attached to catheter.
  j. With cineradiography and videotape, activates automatic injector or injects by hand. Activates cine, fluoroscope and videotape recorder, and views flow of contrast on TV monitor. Moves table as appropriate for optimal viewing of the areas of interest.
  k. Has serial films processed at once and views when ready, and/or prepares to review procedure on videotape playback as indication of information on cine film.
  l. While arteriograms are being processed, performer examines and talks to patient (if conscious) to evaluate how the patient has re-

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sponded to the procedure and the injection.

- i) Reflushes catheter.
- ii) Evaluates any ECG and pressure readings during initial injection as possible contraindication for any additional injections.

m. Performer has videotape record played back on TV monitor; "freezes" views of interest for further study, and/or looks at serial arteriograms on view boxes. Places any biplane views together.

- i) Checks for technical quality,and notes whether any irregularities are due to artifacts or actual pathological or abnormal conditions, and whether the views are clear enough for medical interpretation. Performer may ask opinion of another radiologist.
- ii) Determines whether the radiographs or videotape images adequately demonstrate the vessels and structures being studied, and provide sufficient information about any pathology, blockage, or distortion of the flow, the extent and location of any anomalies, emboli, malformation, and other signs of abnormal structure or pathology.
- iii) Performer considers whether to inject additional contrast, repeat injection and filming with change in technical factors or patient position. Performer may decide that the information suggests the need to selectively catheterize the right and/or left coronary artery and carry out left ventriculography.
- iv) In deciding whether to repeat examination or proceed with selective catheterization, performer considers the patient's condition, the contraindications,the information already supplied, and the urgency. May discuss with anesthesiologist, and/or cardiologist.
- v) Repeats appropriate steps if so decided, continues, or terminates as described below.

9. If performer is to carry out left ventriculography,proceeds as follows:

a. Performer withdraws or places catheter in a relaxed position in the aortic arch.

- i) Reinserts guide wire to the proximal end of catheter.
- ii) If a different catheter will be used, performer gently removes catheter while compressing the artery. Passes appropriate catheter over the guide wire and advances to proximal end of wire under fluoroscopic control. Flushes catheter.

b. Performer advances catheter and guide wire by passing them up the aortic arch and down the ascending aorta to the aortic valve,under fluoroscopic control.

c. Continues to advance catheter assembly through the valve into the left ventricle. May have cardiologist take over for placement within heart cavity. If performer is to proceed personally:

- i) Notes whether ECG monitor reports extra ventricular systoles.
- ii) Passes catheter beyond the left ventricular outflow tract into the center of the left ventricular cavity or towards the apex of the heart. Removes guide wire. Flushes catheter.

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iii) If there is any indication on TV monitor or from monitoring that a coronary artery has been entered, performer withdraws catheter and guide wire into ascending aorta and allows patient to recover for a few minutes.

iv) If performer has difficulty entering through the aortic valve, withdraws guide wire some distance and allows catheter to assume preformed curve. Under fluoroscopic control performer advances catheter; manipulates gently so that the curve tip enters the valve. Repeats if necessary and advances catheter to the center of the ventricular cavity or the cardiac apex. Removes guide wire.

v) If a conscious patient experiences palpation and apprehension, performer reassures that this will cease, and allows a rest period. If not already done, makes sure to remove guide wire.

vi) If extra systoles persist, performer withdraws catheter to ascending aorta and allows patient to rest. Performer then may decide to try again, as described. If patient has rheumatic heart disease, performer may decide to abandon attempt at ventriculography.

vii) Performer checks that catheter tip is lying freely within heart cavity. Notes whether catheter tip moves with adjacent heart wall or freely. Uses a small amount of contrast medium and makes test injection with catheter positioned for diagnostic injection. Evaluates from appearance of flow if tip has

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penetrated the endocardium. Adjusts catheter as appropriate. Reflushes.

d. Performer orders that ventricular pressure be recorded before, during, and after injection of the contrast.

e. Selects volume of contrast solution based on patient's age, size, size of left ventricle cavity and cardiac output.

f. Performer has table positioned for right anterior oblique cine projections, single or biplane cineradiography and/or seriography in AP and lateral projections. Has equipment positioned and tube(s) collimated as appropriate.

i) Selects proper rate and force for automatic or hand injection and avoids high pressures.

ii) Orders rate for cine filming based on patient's age.

iii) Checks condition of patient with cardiac team.

g. Performer carries out injection and filming as described above, and observes on TV monitor.

i) Activates cine recorder; then has patient hold still or awaits anesthesiologist's signal.

ii) Injects contrast and has serial filming begin.

iii) While observing on TV monitor performer decides whether to repeat injection or terminate ventriculography. With seriography has films processed and evaluates as described.

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iv) Performer repeats injection and positions table for additional views as decided and as described. Allows appropriate period of time between injections for reactions to contrast to dissipate.

h. Performer reflushes catheter. Has pressure and ECG continuously monitored while performer withdraws catheter into a relaxed position in the aortic arch.

10. If performer is to carry out selective left coronary arteriography, proceeds as follows:

a. If prior nonselective coronary angiography or left ventriculography has been done, performer reinserts guide wire and advances to the proximal tip of the catheter, allowing assembly to lie in relaxed position in the aortic arch.

i) Removes the catheter while compressing the artery and threads appropriate left coronary catheter over the guide wire to its proximal end under fluoroscopic control.

ii) Performer attaches adaptor, and connects syringes with physiologic solution and anticoagulant if appropriate, syringe with contrast, and pressure monitoring transducer.

iii) If coronary catheter is radiolucent, fills with contrast solution.

b. If not already done, removes guide wire. Rotates table with patient supine to a 20° right posterior oblique position.

c. Performer advances the catheter along the aortic arch and down the medial or left wall of the ascending aorta. Allows it to drop into the sinus of Valsalva on the left, and then into the opening of the left coronary artery, while viewing medium-filled or radiopaque catheter on TV monitor.

d. Performer fixes catheter so that it is just inside the orifice of the left coronary artery with the secondary bend of catheter braced against the right aortic wall.

e. Has catheter pressure monitored continuously; readjusts position of tip if any damping occurs.

f. If pressure reading is normal, performer checks location with test dose of contrast as described. Notes flow on TV monitor and evaluates whether artery is visualized or contrast is being swept into aorta. Repositions catheter so that some contrast refluxes into aorta and details the origin of the artery. Flushes catheter.

g. Performer has fluoroscopic unit(s) and/or x-ray tube(s) of serial changer(s) positioned so that the origin of the left coronary artery is in the upper part of the field, with the catheter tip near the top of the field. Makes sure that field is collimated to include the whole of the heart.

i) Specifies positioning of table and tubes for appropriate 45° to 70° left anterior oblique view. May also order left lateral projections, 15° to 20° right anterior oblique view.

ii) Uses single plane, and horizontal beam for lateral and oblique projections.

iii) Reconfirms cine rate and/or program for serial filming.

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h. Performer checks for appropriate amount of contrast to inject by hand.
i. Rehearses patient in holding breath after deep inspiration or indicates respiration phase needed to anesthesiologist.
j. Makes sure that test injection continues to wash out and that there is no damping of pressure.

  i) If the arterial pressure falls and cannot be raised by adjustment of catheter, performer allows catheter to remain in artery only for injection and filming. Withdraws and reinserts for any repeat filming.
  ii) If the patient has a small or narrow (stenotic) coronary orifice,performer may withdraw catheter until everything is ready for filming. Performer then briefly repositions catheter, injects contrast,and removes catheter before filming.

k. Checks with anesthesiologist (if present) and/or ECG monitor or cardiac team to determine patient's condition.
l. Performer makes hand injection and orders filming as appropriate

  i) Has patient hold breath on inspiration if conscious, or waits indication from anesthesiologist that breath has been suspended on inspiration.
  ii) Activates cine and videotape equipment; makes hand injection, and tells technologist when to start serial changer.
  iii) Observes on TV monitor and has serial arteriograms processed at once. May move cine unit along course of coronary artery.

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m. During injection performer notes EKG response for typical changes. Makes sure contrast medium clears beyond tip of catheter at end of injection. If not, removes catheter at once.
n. Has serial films processed at once; checks patient's condition with cardiac team.
o. Reassures patient. Removes catheter into aortic arch if appropriate and/or reflushes catheter. May have patient cough vigorously to increase coronary blood flow and cardiac output, unless this causes patient anxiety.
p. Performer looks at the first set of serial coronary arteriograms on view boxes in sequence as soon as they are processed. May review videotape record as described earlier.

  i) Checks for technical quality and notes whether any irregularities are due to artifacts or actual pathological or abnormal conditions, and whether the views are clear enough for medical interpretation. Performer may ask opinion of another radiologist or cardiologist.
  ii) Determines whether the arteriograms adequately demonstrate the left coronary artery and branches and provide sufficient information about any pathology, blockage, or distortion of the flow, the extent and location of any anomalies, malformation, the presence of aneurysms, emboli, and other signs of abnormal structure or pathology.
  iii) Performer considers whether injection should be repeated for additional projections.

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iv) Considers the patient's condition, the contraindications, the information already supplied, and the urgency. May discuss with anesthesiologist and/or cardiologist.

q. Repeats additional injections as appropriate, as described. Reflushes catheter. Allows appropriate elapse of time between injections for patient to respond optimally.

11. If performer is to carry out selective right coronary arteriography, proceeds as follows:

a. If prior filming has been done, such as left coronary arteriography, withdraws catheter into a relaxed position in the aortic arch.

i) Reinserts guide wire and advances to the proximal tip of the catheter in aortic arch.
ii) Removes catheter while compressing the artery and threads appropriate right coronary catheter over guide wire to proximal end.
iii) Attaches syringes with contrast, flushing solution, and attaches pressure monitoring device.

b. Removes guide wire. Rotates table with patient supine to 20° right posterior oblique position.
c. Under fluoroscopic control, advances catheter tip from aortic arch down medial wall of ascending aorta to a point a little above the left sinus of Valsalva.

i) Rotates patient to left anterior oblique position.
ii) Rotates catheter slowly in clockwise direction about 60° until the tip drops into the right sinus of Valsalva. Continues rotation until catheter tip drops into the right coronary orifice. Performer may advance catheter during rotation.

d. Performer has arterial pressure monitored, makes test injections, and repositions catheter based on results as described earlier.
e. Performer positions patient for right anterior oblique, left anterior oblique and/or left lateral views.

i) Has catheter tip visualized in the upper left quadrant of the field.
ii) Makes sure the pulmonary conus and the coronary sinus branches above the origin of the coronary artery will be included in the field, as well as the entire heart.

f. Performer sets up for single plane cineradiography, seriography and manual injection as described.
g. Performer makes injection, activates and/or orders filming; watches on TV monitor. Reviews arteriograms, checks on patient's condition, and repeats as appropriate as described earlier.

12. Throughout procedure performer checks with cardiac team on how the patient is responding. May assist in providing emergency care:

a. Removes catheter into aortic arch at once.
b. Performer helps determine the severity of patient's reaction by ob-

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serving the monitoring of the patient's respiration, pressure; notes EKG readings.

c. If patient has a severe reaction to the procedure or contrast medium, such as cardiac arrest, arrhythmia, ventricular fibrillation, ventricular tachycardia, anaphylactic shock (exaggerated negative reaction to the foreign substance), bronchospasm or laryngospasm (stricture of bronchial tubes or larynx), hypotension (drop in blood pressure), cyanosis (bluish discoloration due to excessive concentration of reduced hemoglobin in blood), urticaria (vascular skin reaction), or violent sneezing, performer proceeds at once to assist with emergency life support or measures to control the reaction:

  i) May help administer oxygen or air using oxygen tank and mask or ambu bag; may clear airway using finger or tongue blade.
  ii) May help to establish an airway by removing any dentures and, using a laryngoscope (to view larynx) insert an endotracheal tube.
  iii) May apply closed chest cardiac massage or a blow to the chest.
  iv) Depending on ECG results may apply defibrillator by selecting watt seconds, applying and raising watt seconds until effective.
  v) Depending on ECG results, may administer a prepared intracardial injection of a heart stimulant.
  vi) May administer IV infusion; may order and administer a corticosteroid, an antihistamine or atropine.
  vii) May administer Valium in solution through the injection tubing.

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  viii) May ask a conscious patient to cough to relieve symptoms of functional standstill produced by coronary catheterization in first 15 seconds after response.

d. If performer notes any signs of arterial spasm, may inject an anticoagulant, and/or apply hot packs at once to avoid thrombotic occlusion.

e. Performer helps decide whether the reaction is sufficiently controlled to proceed.

  i) If decision is to terminate procedure, notifies appropriate medical staff; has patient transported to appropriate location.
  ii) Records patient's reactions and what was done on patient's chart. If appropriate, makes sure patient is informed of the type of drug that caused the reaction or explains to patient that he or she is allergic to the contrast solution (i.e. iodine-based solution).

f. If performer judges that patient displays a strong (but not emergency) allergic reaction:

  i) Performer may order and administer a corticosteroid, an antihistamine or atropine.
  ii) Records reaction and what was done. Explains if appropriate to patient that he or she is allergic to the contrast solution.

13. Performer decides when the radiographic examination is completed

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based on information on the angiograms and the patient's condition. Informs anesthesiologist (if present), cardiac team, technologist, and other staff that procedure is to be terminated.

a. Performer returns to the patient. If patient is conscious, performer reassures patient and explains what will happen next.
b. Removes any connecting tubes or syringes from catheter.
c. Performer gently and slowly withdraws the catheter. Manipulates catheter by turning and pulling carefully, taking care not to injure the vessel or enlarge the wound at the entry point.
d. Performer compresses the vessel proximal to or at the puncture site with the fingertips and/or sterile gauze for an appropriate amount of time.

    i) Does not totally occlude the artery. Checks that there is a pulsation distal to the puncture site and no hematoma at the site.
    ii) May have a staff member continue the compression for the time needed. Makes changeover so as to maintain pressure by withdrawing own hands from under those of the relieving staff member once they are in place.

e. Performer applies or orders pressure dressing to be kept in place appropriate amount of time.
f. Performer may order fluids to be given intravenously or by mouth. May order bed rest for appropriate period while patient recovers from effects of procedure.
g. Arranges to have puncture site, extremities and arterial pulses examined regularly over the next few hours and any problems reported at

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once. Informs patient or attending staff to report further oozing of blood or swelling.
h. Performer may order careful observation of patient including vital signs, urinary output, and skin care. May order tests, fill out order forms. May order medication.
i. May order delayed urogram and/or chest film for an appropriate amount of minutes after last injection.
j. Has appropriate sanitary clean up procedures carried out.
k. If requested, calls clinician and reports preliminary results and findings.

14. Performer records impressions of procedure on patient's chart:

a. Preliminary findings.
b. How patient tolerated procedure.
c. Any special nursing follow-up recommended, tests, delayed films ordered, records and observation required, medication, later studies ordered.
d. May sign chart, requisition sheet or order forms.

TASK DESCRIPTION SHEET

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1. What is the output of this task? (Be sure this is broad enough to be repeatable.)

Angiograms,cine film and related diagnostic materials on a patient read,interpreted;medical conclusions drawn and recommendations made orally or dictated;patient's physician called about emergency signs;selected angiographic material earmarked for study or library use;material rejacketed;report placed for typing.

2. What is used in performing this task? (Note if only certain items must be used. If there is choice, include everything or the kinds of things chosen among.)

X-ray requisition forms;current angiograms,videotape and/or cine film and other diagnostic information;view boxes;cine screen and projector;TV monitor;stereo viewer;prior and collateral radiographic materials;marking tape;magnifying glass;telephone; dictation equipment;pen.

3. Is there a recipient, respondent or co-worker involved in the task? Yes...(x) No...( )

4. If "Yes" to q. 3: Name the kind of recipient, respondent or co-worker involved, with descriptions to indicate the relevant condition; include the kind with whom the performer is not allowed to deal if relevant to knowledge requirements or legal restrictions.

Co-workers;specialist;surgeon;referring physician

5. Name the task so that the answers to questions 1-4 are reflected. Underline essential words.

Reading,interpreting and making recommendations on non-neurologic angiographic and related studies and/or giving opinions to clinicians or co-workers by reviewing relevant medical information and requisition sheet(s);evaluating current and prior films and collateral diagnostic materials for medical information;notifying referring physician of emergency signs;explaining opinions or dictating findings and recommendations;placing report for typing.

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Performer reads and interprets completed non-neurologic angiograms and cineangiograms, or provides opinions to co-workers, clinical specialists or surgeons, when requested, on interpretation and conclusions regarding angiographic materials.

1. Performer prepares to view the materials:
    a. If responding to request, performer goes to where radiographic material is on view (such as on view boxes, videotape replay on TV monitor, or cine film projected on screen). Listens while co-worker explains problem regarding how to proceed next, or problem of interpretation. May ask to see prior diagnostic materials, collateral data.
    b. If reading and interpreting own completed work, performer obtains the jacketed angiograms, processed radiographic workups, requisition forms and notes. Includes current series of angiograms, cine film in cassette, a projector, related diagnostic materials, any results of function studies, EKG and pressure readings taken during procedure, the relevant requisition sheets, and other prior scans or studies if available.

OK-RP;RR;RR

6. Check here if this is a master sheet..(x)

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- i) Goes to reading and viewing area and sets up radiographic materials on view boxes or prepares to project cine film on screen.
- ii) Views serial films in sequence; places biplane views together; uses stereo viewer for stereo films.
- iii) If not already done, performer removes the cine film from the cassette, threads this into projector and projects on screen.

2. Performer asks about, reads, and/or reviews all the relevant case material.

   a. If appropriate, may adjust speed of projector, turn film forward or back and may comment on what is being observed. May make notes. May use tape to mark cine film.
   b. Notes decisions made during the procedure; with completed work, notes preliminary notes recorded during or just after procedure was done.

3. Performer evaluates the material to determine whether there is adequate information to make possible a competent medical interpretation.

   a. Notes whether any irregularities are due to artifacts or actual pathological or abnormal conditions.
   b. Determines whether the angiograms adequately demonstrate the vessels and structures being studied.
   c. May evaluate whether the angiograms provide consistent and reproducible evidence of pathology or structural details given the purpose of the examination.
   d. Determines whether the angiograms provide sufficient information about any pathology, blockage, or distortion of the flow, the extent and location of any anomalies, malformation, the presence of aneurysms, emboli, thrombi and/or other signs of abnormal structure or pathology or the location of structures being examined or evaluated.

4. Performer notes or explains what is being demonstrated on the cine film and angiograms in relation to the purpose of the study.

   a. If performer is preparing own report, decides what is relevant.
   b. If performer is answering co-workers questions, focuses on the co-worker's problem in relation to what is evident on the film(s).
   c. In each case, performer describes what appears on the films; explains implications. Points out abnormalities. (May explain idiosyncratic artifacts due to technique.) Performer may consider and/or refer to changes over time, referring or switching to earlier materials.
   d. If appropriate, performer answers questions; replays sections of the film.

5. Performer decides what conclusions can be drawn, what recommendations to make, and what to report (orally if answering request or dictated if required for report).

   a. Decides whether any abnormalities or changes warrant the immediate attention of the patient's physician. If so, telephones physician at once and discusses findings, or makes recommendations to co-worker.

TASK DESCRIPTION SHEET (continued)

Task Code No. 484

This is page 3 of 3 for this task.

List Elements Fully	List Elements Fully
b. Explains interpretation and recommendations. Indicates how conclusions were arrived at, including medical and technical considerations. c. Indicates what implications can be drawn from findings and what conclusions and/or courses of action are warranted, including need for additional studies, tests, or courses of treatment. 6. Performer dictates findings (for own work) by explaining what appears on the films. Describes worrisome or suspicious signs, obvious abnormalities and/or changes over time, referring to earlier films. (Might indicate presence of artifacts which do not have medical significance.) Dictates report in the style: There is...on.... It has the characteristics of.... I believe that this indicates.... This could mean that.... It is necessary to determine whether.... This can be done by.... 7. When performer has completed interpretation, rewinds and replaces cine film in cassette holder. If appropriate, arranges to have materials returned, including projector, cine film cassette (s), jacketed angiograms, requisition sheets and other case history materials. a. If interpreting own materials for report, may decide whether any of the material is unusual or of special interest and warrants inclusion in museum library, or should be used for study purposes. Marks appropriately if so decided. b. Returns own patient's radiographic material, requisition sheet and tape of dictation to proper jacket, and places to be picked up for typing.	

TASK DESCRIPTION SHEET

Task Code No. 485

This is page 1 of 2 for this task.

1. What is the output of this task? (Be sure this is broad enough to be repeatable.)

Presentation prepared and made on angiography developments or case studies; presentations of vascular surgeons, cardiologists, or angiographers listened to; discussions participated in; conference opened, conducted, and closed, when appropriate.

2. What is used in performing this task? (Note if only certain items must be used. If there is choice, include everything or the kinds of things chosen among.)

Radiographic and medical equipment; radiographic materials; case histories; view boxes; slide projectors

3. Is there a recipient, respondent or co-worker involved in the task? Yes...(x) No...( )

4. If "Yes" to q. 3: Name the kind of recipient, respondent or co-worker involved, with descriptions to indicate the relevant conditions; include the kind with whom the performer is not allowed to deal if relevant to knowledge requirements or legal restrictions.

Vascular surgeons; cardiologists; radiologists (angiographers)

5. Name the task so that the answers to questions 1-4 are reflected. Underline essential words.

Participating in meetings of angiographers, vascular surgeons and cardiologists to discuss new developments, cases of interest, and case problems in the field of angiography, vascular and cardiovascular surgery by planning and presenting report on new developments in the radiologic field, interesting case studies, or problems in current cases; and/or by deciding to listen to presentations about new developments in surgery, interesting case studies, or case problems; participating in discussions; leading conference sessions when appropriate.

List Elements Fully

Performer attends meetings of medical staff and co-workers in vascular surgery, angiography and /or cardiology to discuss areas of mutual concern.

1. Performer may prepare presentations describing new work in the field of angiography:
   a. Performer decides what to present and in what degree of depth and detail.
   b. Decides on how to make presentation and what to use.
   c. May prepare outline, obtain special instructional materials, do research on topic for use in presentation. May have resident assist.
   d. May prepare slides from own source of radiographs or may obtain existing radiographic material and slides from library. May have resident assist.
   e. At meeting, when performer is called upon, places radiographs, spot films or other radiographic materials on view boxes or uses slide projector. Describes work selected, answers questions, and participates in discussion. May recommend further reading.
   f. Performer, may, when appropriate, demonstrate or simulate new and/or relevant techniques, equipment or procedures.
   g. After presentation, performer replaces materials and equipment or has this done.

OK-RP; RR; RR

6. Check here if this is a master sheet..(x)

TASK DESCRIPTION SHEET (continued)

Task Code No. 485

This is page 2 of 2 for this task.

List Elements Fully

2. Performer may attend conferences at which vascular surgeons and/or cardiologists present case studies and raise the problems involved, or performer may choose cases which are of interest from the library or personal files which are of educational interest:

   a. Performer may be told beforehand by department head or conference leader what current or past cases will be presented for discussion, or performer will discuss the type of information to be covered in order to select relevant cases.
   b. Performer obtains the radiographic materials related to the cases selected or selects appropriate cases. May have assistant gather materials; reviews to be sure they are appropriate.
   c. Performer reviews the radiographs and the requisition sheets involved, and any other relevant medical information such as reports and interpretations already made.
   d. Performer may make notes to use as reference, pointing out fine points with regard to interpretation of the radiographs in connection with pathological symptoms and conditions.
   e. At the conference, performer presents the radiographs involved as appropriate, and presents interpretation; makes relevant points so as to instruct the audience in the reasoning involved. Participates in the discussion as appropriate; answers questions. May suggest reference articles on subject.
   f. Performer replaces radiographic materials or has these replaced when done.
   g. If called on to lead conference, performer opens conference; calls on coworkers to present cases; leads or chairs discussions and question period; closes meeting.

List Elements Fully

   h. If current case studies are involved, performer may maintain files on the case(s) and read reports including final diagnosis and treatment prescriptions.

3. Performer may decide to attend presentation by vascular surgeons, cardiologists or co-workers. May make notes, ask questions, and/or participate in discussion.

4. Performer may decide to attend presentation about a particular case that is of interest. May make notes, ask questions and/or participate in discussion.

5. Performer may decide to present relevant problems that performer is personally having trouble with and ask for comments and suggestions from participants.

   a. Selects the case material needed to present the problem.
   b. Makes presentation and poses problems involved.
   c. Listens and participates in resulting discussions.

TASK DESCRIPTION SHEET

Task Code No. 486

This is page 1 of 2 for this task.

1. What is the output of this task? (Be sure this is broad enough to be repeatable.)

Radiology resident shown and explained procedures involved with non-neurologic angiography;resident evaluated for readiness to do activities under supervision;resident observed and criticized;resident evaluated for readiness to do tasks without direct supervision;resident's work spot checked and criticized;questions answered;opinions on work given as requested;evaluation noted informally.

2. What is used in performing this task? (Note if only certain items must be used. If there is choice, include everything or the kinds of things chosen among.)

X-ray requisition forms;materials and equipment needed for angiographic procedures; related radiographs,scans, view boxes; emergency equipment; stereo, videotape, cine equipment and viewing devices; ECG and pressure monitoring equipment;life support equipment

3. Is there a recipient, respondent or co-worker involved in the task? Yes...(x) No...( )

4. If "Yes" to q. 3: Name the kind of recipient, respondent or co-worker involved, with descriptions to indicate the relevant condition; include the kind with whom the performer is not allowed to deal if relevant to knowledge requirements or legal restrictions.

Radiology resident to be instructed in non-neurologic angiography;any pt. involved;surgeons;specialist;clinicians;supervisor of residents

5. Name the task so that the answers to questions 1-4 are reflected. Underline essential words.

Providing clinical training for radiology resident in non-neurologic angiography by demonstrating procedures,explaining what is being done,answering questions;deciding when resident can perform tasks under direct supervision;observing and correcting; deciding when tasks can be done without direct supervision;spot checking and correcting;advising as requested or as deemed necessary.

List Elements Fully

Performer provides clinical training to residents in radiology in the area of non-neurologic angiography, covering choice of examinations, special handling, vascular routes, techniques, equipment, materials, contraindications, medical and surgical aspects of procedures, interpretation of radiographic material, and possible recommendations and treatments.

1. Performer provides demonstration, explanation, informal evaluation and supervision in: reading requests for angiographic studies and deciding on best available procedure; what to look for; available medical and technical procedures including surgical entry, choice of contrast media, technical equipment, positions and angles, special handling and immobilization, function studies, pressure readings, indications, contraindications; prior preparation, sedation, cardiac monitoring, anesthesia, emergency care; providing technical and medical interpretation of radiographic materials; learning range of diagnostic,and/or structural medical conclusions that can be drawn; alternative and additional procedures and tests; therapeutic procedures; and courses of treatment to consider or perform.

OK-RP;RR;RR

6. Check here if this is a master sheet..(x)

TASK DESCRIPTION SHEET (continued)

Task Code No. 486

This is page 2 of 2 for this task.

List Elements Fully

2. When performer is assigned a resident, may select times, patients, and procedures to demonstrate, and may explain to resident while performer carries out own tasks.

   a. Performer explains what will be taught.
   b. Performer may narrate the steps, may explain what is being done, or may explain the basis for decisions and actions.
   c. Performer may decide to solicit questions to find out what the resident understands, may answer questions, or may elaborate on the explanation of what is being done, concentrating on the relevant skills and knowledges.
   d. Performer decides when the resident has observed sufficiently and has a clear enough understanding of a procedure to carry it out under close, direct supervision and/or to assist.

3. Performer supervises and observes resident carrying out activities assigned.

   a. Performer asks the resident to do all or part of a procedure and remains at the side of the patient or carries out own portion and watches the resident perform the assigned activity.
   b. While observing, performer decides whether the activity is being done properly, whether there is a specific problem, whether there is need to demonstrate the procedure again or explain, and does so.
   c. Performer may comment on the performance, encourage or correct as deemed necessary, or do this later.
   d. Performer may decide to intervene and take over the procedure, explaining to the resident what was done incorrectly at that point or later.

List Elements Fully

   e. If decision is to demonstrate again, performer may redo and have the resident observe, or have resident repeat the procedure until it is done properly.
   f. Performer decides which procedures or activities can be done by the resident without direct supervision (although radiologist remains responsible). Informs proper supervisors, notes for own use, and/or tells this to resident.

4. Performer spot checks resident carrying out activities without direct supervision or responds to requests for guidance, assistance, or further instruction.

   Performer proceeds as in steps 2 or 3 as appropriate, observing, noting areas needing improvement, determining nature of problem, assisting, giving opinions, answering questions, and providing further instruction on how to deal with unusual circumstances. Reinforces correct work. Suggests areas for improvement.

5. When patients are present for demonstrations, performer may explain presence of resident; when observing, performer may explain own presence.

6. Performer informally notes the extent of learning or proficiency of resident throughout the training:

   a. May decide to discuss performance with resident at any time.
   b. May keep records on what was taught or on resident's progress. May make personal notes for use in later evaluation meetings.

TASK DESCRIPTION SHEET

Task Code No. 487

This is page 1 of 2 for this task.

1. What is the output of this task? (Be sure this is broad enough to be repeatable.)

Outline and content planned and prepared for lecture to residents or case conference on non-neurologic angiography; lecture given; conference conducted by use of questions and answers.

2. What is used in performing this task? (Note if only certain items must be used. If there is choice, include everything or the kinds of things chosen among.)

Paper, pen; instructional and reading material on angiography; radiographic materials; projector and slides; cine film and projector; screen; view boxes

3. Is there a recipient, respondent or co-worker involved in the task? Yes...(X) No...( )

4. If "Yes" to q. 3: Name the kind of recipient, respondent or co-worker involved, with descriptions to indicate the relevant condition; include the kind with whom the performer is not allowed to deal if relevant to knowledge requirements or legal restrictions.

Residents in radiology; program director; co-worker; library and/or clerical personnel

5. Name the task so that the answers to questions 1-4 are reflected. Underline essential words.

Planning and presenting lectures or case conferences on non-neurologic angiography for radiology residents by deciding on content, method of presentation; preparing material; presenting lecture, being aware of responses and adjusting presentation to students' needs; using radiographic material in question and answer format to demonstrate aspects of topics for instructional purposes.

List Elements Fully

Performer presents lecture(s) or holds case conferences on angiography (excluding neurologic angiography) for classes of radiology residents.

1. Performer is notified of assignment or decides what should be covered and at what depth and degree of detail, considering the residents' current academic level and objectives of the residency program.

2. Decides on method of presentation and plans lecture and/or case conference:

   a. Prepares outline.
   b. May obtain special instructional materials or asks co-worker to obtain for review. May use materials already prepared.
   c. May do research in topic area for use in lecture.
   d. May prepare slides from own source of radiographs (teaching cases) or may obtain existing radiographic, cine material and/or slides from library. May ask co-worker to obtain for review, or personally chooses radiographs or cine film to illustrate problem cases for a question and answer session. Performer may choose materials to contrast normal and pathological states.
   e. Decides on time to allocate for questions and answers for lecture, or may choose residents to present case

OK-RP;RR;RR

6. Check here if this is a master sheet..(X)

TASK DESCRIPTION SHEET (continued)

Task Code No. 487

This is page 2 of 2 for this task.

List Elements Fully	List Elements Fully
material for case study conference. If so, discusses as needed. 3. At a case conference, places radiographs, spot films or other radiographic materials on view boxes or uses slides and projector. Shows cine film using projector. May have resident(s) present material. Has residents give interpretations of materials. Throws out questions about materials; evaluates and responds to answers, or answers questions and participates in discussion about cases involved. Chooses how to present answers and comments so that residents will understand how answers were arrived at. 4. At a lecture, presents material as deemed appropriate. May note whether information is being understood, and adjust presentation accordingly. 5. Performer may recommend reading to students. 6. May make personal notes on residents for use in evaluation meeting. 7. Performer may keep material and notes prepared for future use; has materials taken from library and equipment returned. Note: Does not submit outline or materials for review. Does not formally test. This represents current practices.	

TASK DESCRIPTION SHEET

Task Code No. 488

This is page 1 of 6 for this task.

1. What is the output of this task? (Be sure this is broad enough to be repeatable.)

Decisions on whether to go ahead with computerized transverse axial tomographic body scans,the angles, levels,thickness of slices;scans viewed as brightness or color display on cathode ray tube,and/or scan photographs,and/or numerical computer output interpreted;decision made on repeat,use of IV contrast injection or infusion;IV administered;complete set of transverse axial scans approved;medical impressions,recommendations recorded.

2. What is used in performing this task? (Note if only certain items must be used. If there is choice, include everything or the kinds of things chosen among.)

X-ray requisition form,patient's chart,prior radiographs,scans;view boxes;prepared sterile tray with materials needed for IV infusion or injection of iodine-based contrast solution;tourniquet,materials and equipment on emergency cart,telephone;pen;equipment for computerized transverse axial tomographic scanning,control console,viewing unit;absorption coefficient chart(s);forms

3. Is there a recipient, respondent or co-worker involved in the task? Yes...(✓) No...( )

4. If "Yes" to q. 3: Name the kind of recipient, respondent or co-worker involved, with descriptions to indicate the relevant condition; include the kind with whom the performer is not allowed to deal if relevant to knowledge requirements or legal restrictions.

Any pt.;attending adult,nurse or staff member;radiologist;referring clinician;specialist clinician;radiologic technologist

5. Name the task so that the answers to questions 1-4 are reflected. Underline essential words.

Directing computerized transverse axial tomography of the body of any pt. by deciding whether to proceed;reassuring pt.;selecting levels,angles,thickness of slices for scans;viewing cathode ray tube, and/or photographs of scans display,and/or numerical print-out of absorption coefficients;interpreting; deciding whether to repeat,inject or infuse contrast intravenously;continuing as decided with IV;deciding when examination is completed by viewing transverse axial scans;recording medical impressions and needed nursing follow-up.

List Elements Fully

Performer receives the x-ray requisition form and medical information on a patient scheduled for computerized transverse axial tomography of the body (cross section radiographic scans at various levels of the body, based on differential radioabsorption of various types of normal and abnormal tissue and other substances; abbreviated as C.T., C.A.T., C.T.T., or E.M.I. or A.C.T.A. scans, depending on equipment).

1. Performer reads the patient's requisition form and relevant information to become familiar with the case or to review materials seen earlier.
   a. Notes patient's age, sex, weight, height, name of referring physician.
   b. Notes nature and location of suspected pathology, size of area of pathology if estimated, and purpose of study, such as screening for diagnostic information, pre- or post-operative or therapeutic evaluation, use in connection with other diagnostic procedures. Notes whether procedure is to be treated as emergency.
   c. Performer reviews the patient's relevant medical history and chart. Examines any prior diagnostic information such as radiographs, ultrasonograms,radioisotope scans, results of clinical or lab tests, prior C.T.T. scans.

OK-RP;RR;RR

6. Check here if this is a master sheet..(X)

TASK DESCRIPTION SHEET (continued)

Task Code No. 488

This is page 2 of 6 for this task.

List Elements Fully

d. Notes whether patient has history of allergies or adverse reaction to contrast. Notes presence of any collateral conditions such as communicable or infectious condition. Checks whether female patient may be pregnant.
e. Performer checks whether all prior preparatory procedures ordered have been carried out as appropriate to area of interest, such as period for withholding of food, cleansing enema, prior administration of analgesic and/or sedation, and at appropriate time. If not, arranges to have these done and/or procedure delayed.
f. Notes recommendations on levels of interest, angulation, thickness of "slice" for the scans, use of density enhancement with contrast solution; notes whether routine "base line" study is ordered.
g. Notes whether patient will be accompanied by nurse or attendant.
h. If contrast solution may be injected or infused, checks to see that patient or authorized adult has signed consent for procedure. If not, informs appropriate co-worker and either has examination delayed until written consent is obtained or arranges to obtain personally.
i. Performer may check that no contrast study has been done in the recent past which would leave a residue of contrast in cavities of the body and interfere with accuracy of readings.
j. May check that there is no danger of artifacts such as from implanted dense substances resulting from therapeutic procedures or prosthetic devices. May plan the angle of the scan to avoid these.

2. Performer greets non-infant patient and any accompanying attendant in examination room. Attempts to reassure; explains what will be done.

List Elements Fully

a. May question about patient's symptoms in relation to the condition being studied. May collect additional medical history and ask about previous radiography, allergies.
b. Performer may explain or demonstrate use of equipment to a child to allay fears and enlist cooperation; answers questions. Explains that patient will be asked to hold still for a considerable period of time. Indicates what will happen. Stresses need to maintain position when ordered.
c. If contrast may be injected and consent has not been obtained, performer may describe the procedure and its risks and obtain consent signature from patient before sedation, or authorized adult.
d. Performer notes whether there are current contraindications to going ahead with the procedure.

   i) May have clinician or specialist called; discusses.
   ii) If performer decides not to proceed, records reasons and any recommendations on patient's chart. Informs appropriate co-worker of cancellation. If appropriate, orders rescheduling of patient or scheduling for alternative procedure.
   iii) May decide not to use contrast.

e. With pediatric or disturbed patient, performer may consider whether sedation (or additional sedation) is warranted; may decide to order if patient's behavior and condition suggest the need.

TASK DESCRIPTION SHEET (continued)

Task Code No. 488

This is page 3 of 6 for this task.

List Elements Fully

- i) If initial or additional sedation is to be administered, orders or decides to administer personally. Allows time for medication to take effect.
- ii) May order analgesic if appropriate and not already administered.

f. Performer may give final orders on non-contrast phase of the examination:

- i) Performer may indicate whether a basic scan sequence for the area of the body involved is to be done, or specifies the number of scans, each providing information on two contiguous slices of tissue in a transverse axial plane on either side of a selected level of the body.
- ii) Indicates the levels in cm's above and/or below an anatomical reference line.
- iii) Indicates desired angulation of the slices in relation to the reference line, such as 30°. Has patient positioned as appropriate for the area of interest and angulation required in relation to the machine set up.
- iv) May, if option is available, select the length in inches of the scan, based on the size of the body at the level(s) of interest.
- v) May select the thickness of the slice, if option is available, based on patient's age and the type of detail required.
- vi) May select technical factors within the available range or refers to standardized factors set for the area of interest and patient's age and size.
- vii) May decide to proceed directly to use of contrast. If so, proceeds as in step 6.

List Elements Fully

- viii) If there is any danger of x-ray scatter, performer may have appropriate shielding applied to sensitive areas not being scanned.

3. Performer views the results of the C.T.T. scans in one or more of the following ways:

a. Performer may view the cathode ray tube or TV tube display of the processed information after each scan or by operating viewer controls to retrieve the information from magnetic tape or disc.

- i) Performer adjusts picture brightness and contrast controls to appropriate range, or "window width" covering the type of tissues and pathologies of interest.
- ii) With some equipment performer may select a color coded key for the display, with each color representing a given density range. Selects combinations of colors for the contrasting or continuous density spectrum as appropriate to viewing unit control panel.
- iii) Depending on equipment, performer may use selector to blacken all picture elements at a given range, or to have elements in a given range "flicker."

b. Performer may have photographs taken of the visual display, and examines when processed. If so, may select the "window width" for scaling unless this has been predetermined for a given area of interest. Selects other options as described in a, above.

TASK DESCRIPTION SHEET (continued)

Task Code No. 488

This is page 4 of 6 for this task.

List Elements Fully

c. Performer may review the printed output in a format shaped roughly as the slice, with relative numerical density values printed out.

4. Performer reads and interprets the results by referring to a reference chart in brightness gradations from white to black, in color-coded gradations, and/or in numerical gradations in which standardized relative absorption coefficients for water, gas, fat and relevant normal and abnormal types of tissues and body substances are listed.

    a. Compares the results of the scans with the absorption coefficient standards. Takes account when appropriate of effects of any contrast agent used.
    b. Interprets white areas as tissues of highest density, black as tissues of lowest density, with greys intermediary. Interprets color display in terms of code selected.
    c. Interprets alterations of normal tissue density in terms of the pathological changes known to produce such alterations.
    d. May note effects of computer averaging where there is abrupt drop from high density tissue, such as bone, next to low density material, such as body fluids. Notes effects of patient motion.
    e. Performer attempts to make an initial interpretation of the data for the purposes requested, such as identification of cystic structures, tumorous masses, blood clots, hemorrhages, abnormal cavities, enlarged organs, aneurysms, or other structural indications of normal or abnormal scans. May compare both sides of the body for symmetry. Relates scan information to the clinical data.

List Elements Fully

5. Performer determines whether the C.T.T. scans are technically adequate to demonstrate the area under study and provide adequate information on the nature and position of the pathology. Performer may ask opinion of another radiologist or specialist.

    a. If performer is unsure about the adequacy of the information, may decide to repeat the scans at one or more levels after intravenous infusion or injection of an iodine based contrast medium (to enhance tissue density and improve the differential contrast in the absorption values between normal and abnormal tissue).
    b. If performer considers that there is an artifact due to residual contrast, patient movement, or dense objects introduced in patient's body, may order repeat of one or more scans after appropriate elapse of time and/or with positioning to overcome the problem, and/or use of a motion control setting on the machine.
    c. Performer may order a repeat of the examination with modification such as additional level(s), change in thickness of slice, angulation.
    d. If performer decides to order additional scans and/or proceed with injection or infusion of contrast, performer informs technologist; indicates what is needed; may record.

6. If performer is to initiate procedure with injection or infusion of contrast or decides to administer contrast after review of C.T.T. scans, proceeds as follows:

    a. Performer decides whether to inject contrast solution or use

TASK DESCRIPTION SHEET (continued)

Task Code No. 488

This is page 5 of 6 for this task.

List Elements Fully

continuous infusion over a given period of time. Orders type and amount of contrast based on patient's age,size,area of interest, and nature of the suspected pathology.

b. Makes sure that materials are present for IV infusion or injection as decided. Performer has patient prepared,and checks that procedure tray and emergency cart are present and properly equipped.

c. If performer is to proceed with IV infusion of the contrast solution, checks prepared IV bottle containing appropriate dosage of radiopaque solution. Makes sure dosage is appropriate and that there is no evidence of chemical deterioration.

  i) Sets up IV infusion apparatus near patient. Attaches bottle of prepared contrast solution to sterile IV tubing. Hangs at appropriate height on pole near patient,with clamp in closed position.
  ii) Prepares patient for insertion of IV needle by exposing vein selected, applying tourniquet, and swabbing site with antiseptic solution. Inserts IV needle into position. May immobilize limb.
  iii) Runs fluid through tubing to check flow and remove air. Attaches loop of needle to IV tubing. Adjusts flow in tube to desired rate and starts infusion.
  iv) Checks on patient while infusion is in process.

d. If performer is to proceed with IV injection of the contrast solution, performer may prepare patient personally by exposing arm, applying tourniquet, finding vein, and swabbing site with antiseptic solution, or has this done.

List Elements Fully

  i) Performer selects or checks prepared dose of iodine based radiopaque solution in syringe. Expels air; checks amount as above; makes sure there is no chemical deterioration.
  ii) Inserts needle into vein,checking location by aspirating slightly to note venous return. Removes tourniquet and injects contrast. May inject small amount of contrast, observe reaction,and inject full amount if no reaction. Removes needle and swabs site.

e. Performer observes patient for signs of adverse reaction to the injection of contrast solution. If there is a reaction, performer decides to proceed with emergency care. Removes patient from contrast flow at once.

f. If there are no serious adverse reactions, performer tells radiologic technologist when to go ahead with C.T.T. scans as described above. May indicate proper elapse of time. Repeats specifications as appropriate.

g. Performer remains on call in case of delayed reaction during radiographic examination. If there is a delayed serious reaction, performer proceeds with emergency care.

7. For additional C.T.T. scans performer proceeds as described above. Repeats review of C.T.T. scans as described above until satisfied that they are technically adequate to demonstrate the areas and conditions under study and to provide sufficient information to make possible a competent medical interpretation. Makes

TASK DESCRIPTION SHEET (continued)

Task Code No. 488

This is page 6 of 6 for this task.

List Elements Fully	List Elements Fully

note of effect of contrast on differential tissue densities.

8. Performer decides when the transverse axial tomographic examination is completed. Informs radiologic technologist and other staff that procedure is to be terminated.

   a. Performer may return to the patient. If patient is coherent, performer reassures and explains what will happen next.
   b. Removes IV apparatus (if used for contrast) or has this done. If appropriate, has appropriate sanitary clean up procedures carried out.
   c. If requested, calls specialist or referring physician and reports preliminary results and findings.
   d. Records impressions of procedure on patient's chart:

      i) Preliminary findings.
      ii) How patient tolerated procedure.
      iii) Any special nursing follow-up recommended.
      iv) May sign chart or requisition sheet.

TASK DESCRIPTION SHEET

Task Code No. 489

This is page 1 of 4 for this task.

1. **What is the output of this task?** (Be sure this is broad enough to be repeatable.)

Non-neurologic C.T.T. scans read, interpreted; medical conculsions drawn and recommendations made orally or dictated; pt.'s physician called about emergency signs; selected scans earmarked for study or library use; material rejacketed; report placed for typing.

2. **What is used in performing this task?** (Note if only certain items must be used. If there is choice, include everything or the kinds of things chosen among.)

X-ray requisition forms; current diagnostic material, C.T.T. scans as photographs of scan displays, computer print-outs; C.T.T. viewing unit; prior and collateral radiographic materials; relative absorption coefficient chart(s); telephone; pen; dictation equipment

3. **Is there a recipient, respondent or co-worker involved in the task?** Yes...(X) No...( )

4. **If "Yes" to q. 3:** Name the kind of recipient, respondent or co-worker involved, with descriptions to indicate the relevant condition; include the kind with whom the performer is not allowed to deal if relevant to knowledge requirements or legal restrictions.

Co-worker(s) in radiology, or clinical specialists asking opinions; referring physician

5. **Name the task** so that the answers to questions 1-4 are reflected. Underline essential words.

Reading, interpreting and making recommendations on non-neurological computerized transverse axial tomographic scans of the body, and/or giving opinions to clinicians or co-workers by reviewing medical information and requisition sheet(s); evaluating scans on display tube, photographs of displays, or as computer print-outs; evaluating in connection with clinical data; notifying referring physician of emergency signs; explaining opinions or dictating findings and recommendations; placing report for typing.

List Elements Fully

Performer reads and interprets non-neurologic computerized transverse axial tomographic scans or provides opinions to co-workers and/or medical specialists, when requested, on interpretation and conclusions regarding the scans.

1. Performer prepares to view the materials:

   a. If responding to request, performer may go to where viewing unit is located for computerized transverse axial scans (C.T.T. scans). Listens while co-worker explains problem regarding how to proceed next, or problem of interpretation. May ask to see requisition sheet, clinical data, prior diagnostic materials, collateral data.

   b. If reading and interpreting own completed work, performer obtains the jacketed photographs of the C.T.T. scans and/or computer print-outs, requisition forms and notes. Includes related diagnostic materials, any results of clinical or lab tests, the relevant requisition sheets, and other prior radiographs or scans if available. Obtains C.T.T. absorption coefficient chart(s). Reviews requisition sheet to determine area of interest,

OK-RP;RR;RR

6. Check here if this is a master sheet..(X)

TASK DESCRIPTION SHEET (continued)

Task Code No. 489

This is page 2 of 4 for this task.

List Elements Fully

purpose of study, and clinical data.

- c. Goes to viewer or reading area, depending on whether performer may wish to work directly with information on magnetic tape or disc or will interpret from photographs of the scans and/or computer printouts.
    - i) Performer may examine the photographs of the cathode ray tube display. Notes "window width" used for scaling.
    - ii) Performer may examine the printed computer output in a format shaped roughly as the slice,with relative numerical density values printed out.
    - iii) May go to viewer and have the scan information called from magnetic tape or disc if performer decides there is need to obtain additional information by altering the scaling.

      Adjusts picture brightness and contrast controls to appropriate range or "window width" for the area of interest and type of pathology suspected.

      Depending on equipment, may select a color coded key for display. May use selector to blacken all picture elements at a given range or to have elements in a given range "flicker." May use magnification or other options.
    - iv) May have additional photographs made of displays.
    - v) Performer orients point of view to concept of looking directly down on a cross-section of the body, and then reviews as with radiographs.
    - vi) Identifies relevant structures, their shape, size and position

List Elements Fully

2. Performer asks about, reads, and/or reviews all the relevant case material.
    - a. Notes reason for request, area of interest, patient's age, sex, weight, height, clinical symptoms.
    - b. Notes decisions made during the procedure on technique, such as level, angulation, thickness of slice, and/or length of scan (if such options are available). Notes whether contrast was infused or injected to provide density enhancement of tissue.
    - c. With completed work notes preliminary notes recorded during or just after procedure was done.

3. Performer evaluates the material to determine whether there is adequate information to make possible a competent medical interpretation.
    - a. Notes whether any irregularities are due to artifacts or actual pathological or abnormal conditions:
        - i) May note whether artifacts may be due to presence of high density inserts such as prosthetics in body, remains of prior contrast, effects of computer averaging where there is abrupt drop from high density tissue, such as bone, next to low density material such as body fluids.
        - ii) Notes whether results may be distorted due to patient movement.
    - b. Performer interprets C.T.T. scans by comparing results of scans with standards on chart giving relative

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coefficients of absorption for various types of tissues, water, gas and fat.

- i) Interprets white areas as tissues of highest density, black as tissues of lowest density, with greys intermediary. Interprets color display in terms of code selected for each given density range.
- ii) Interprets alterations of normal tissue density in terms of the pathological changes known to produce such alterations.
- iii) Takes account of effects on tissue density of injection of contrast material, patient motion.
- iv) Interprets data for the purpose requested, such as identification of cystic structures, tumorous masses, blood clots, hemorrhages, abnormal cavities, enlarged organs, aneurysms or other structural indications of normal or abnormal scans.
- v) Where appropriate compares two sides of body for symmetry.
- vi) Interprets data in the light of the clinical evidence and collateral radiographic material.

c. Determines whether the scans adequately demonstrate the structures being studied and provide adequate information on the nature and position of any pathology. Performer may ask opinion of another radiologist or specialist.

4. Performer notes or explains what is being demonstrated on the scans in relation to the purpose of the study.

a. If performer is preparing own report, decides what is relevant.
b. If performer is answering co-workers questions, focuses on the co-worker's problem in relation to what is evident on the scans.
c. In each case, performer describes what appears; explains implications. Points out abnormalities. (May explain idiosyncratic artifacts due to technique.) Performer may consider and/or refer to changes over time, referring or switching to earlier materials.
d. Answers questions as appropriate.

5. Performer decides what conclusions can be drawn, what recommendations to make, and what to report (orally if answering request, or dictated if required for report).

a. Decides whether any abnormalities or changes warrant the immediate attention of the patient's physician. If so, telephones physician at once and discusses findings, or makes recommendations to co-worker.
b. Explains interpretation and recommendations. Indicates how conclusions were arrived at, including medical and technical considerations.
c. Indicates what implications can be drawn from findings and what conclusions and/or courses of action are warranted, including need for additional studies, tests, or courses of treatment.

6. Performer dictates findings (for own work) by explaining what [illegible] on the films. Describes wor[illegible] suspicious signs, obvious abno[illegible] and/or changes over time, re[illegible] to earlier data. (Might indica[illegible]sence of artifacts which do not have medical significance.) Dictates report in the style: There is...on.... It has the characteristics of.... I believe that this indicates.... This

TASK DESCRIPTION SHEET (continued)

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could mean that.... It is necessary to determine whether.... This can be done by.... 7. When performer has completed interpretation, arranges to have materials returned, including jacketed material, requisition sheets and other case history materials. a. If interpreting own materials for report, may decide whether any of the material is unusual or of special interest and warrants inclusion in museum library, or should be used for study purposes. Marks appropriately if so decided. b. Returns own patient's scans, requisition sheet and tape of dictation to proper jacket, and places to be picked up for typing.	